

The IRON AGE

October 30, 1958

A Chilton Publication

The National Metalworking Weekly



Reynolds' Newman—Ford's McMurry

**Aluminum and Autos:
Is Reynolds-Ford Deal
A Breakthrough? P. 43**

**National Output
Heads For New High — P. 65**

**Vacuum Pour
Giant Forging Ingots — P. 81**

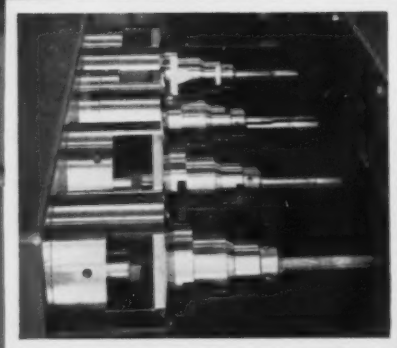
Digest of the Week — P. 2-3



XLO

EX-CELL-O FOR
PRECISION

Intake valve seats and guide holes are machined at left end of machine, exhaust seats and guide holes at the right. Two-compartment fixture permits continuous machine operation.



Gun-type drills extend through spindle centers and retract automatically

CONCENTRICITY GUARANTEED

58-10

Bor-Drills valve guide holes and plunge-faces valve seats in one operation

A Standard Ex-Cell-O 17-A Precision Boring Machine, equipped for the Bor-Dril process, is turning out 23 cylinder heads per hour for a large auto manufacturer.

The table rapid-traverse feeds cylinder heads to the left into four cutters that plunge-face intake valve seats, then retract .020". Next, four gun-type drills advance through the spindle shafts to Bor-Dril guide holes from the solid—with guaranteed concentricity. The table then moves to the right, repeating the process on exhaust valve seats and guide holes.

Find out how the Bor-Dril process can help speed production in your plant; contact your local Ex-Cell-O Representative, or write direct.



Style 17-A Precision Boring Machine equipped for Bor-Dril process drills deep holes from the solid with guaranteed accuracy.

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He never takes anything for granted

It's rare that a Bethlehem inspector has to reject a piece from the drop-forge shops. Bethlehem closed-die forgings are made with great care, and are checked frequently before they reach the inspector. Nevertheless, he never takes anything for granted. His job is to *know* that the product is right before he approves and

releases it prior to shipping.

Final inspection, of course, is only one of many hurdles that a Bethlehem drop forging must clear. But it's a tough one; it's bound to be. A good inspector must forget he has a heart, and think only in terms of cold, impersonal specifications.

Bethlehem inspectors always

know their business. And they're mighty conscientious. That's one of the reasons why you can order Bethlehem drop forgings with complete confidence.

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NEWS ARTICLES

STEEL BUYERS

Delivery Problems Grow—Some steel purchasers are caught between rising needs and lengthening mill deliveries. Delivery jitters are developing as users try to push up shipments and step-up their buying pace. P. 46

LABOR RELATIONS

A New Era Ahead?—If negotiating table strategy continues along present lines we're in for trouble, experts say. Inflation spiral may bring on government controls. P. 48

SKILLED WORKERS

Detroit Strike Threatens—UAW locals representing about 8000 tool and die job shop workers are unhappy with contract offers. They set strike deadline for Nov. 2. P. 49

COPPER FOIL

Clear Sailing—Makers of copper foil say their future never looked brighter. Big gains are expected in their currently big markets for several good reasons. P. 50

MAGNESIUM IN AUTOS

Rival for Aluminum — Light-weight trend in the auto industry spurs magnesium producers into action. Coming price cuts may touch off a battle with aluminum. P. 60

NATIONAL ECONOMY

Heading for New High—Gross

Metalworking



HOT METAL MEN: R. B. Newman (left), manager, Reynolds' Listerhill reduction plant, and H. G. McMurry, manager of neighboring Ford casting plant, pause in front of a crucible of molten aluminum. Hot metal is shipped directly to customer—a growing trend. P. 43

National Product could reach \$450 billion annual rate next year. Important economic indicators are on the rise after period of slump. P. 65

LANDING TOOL ORDERS

There's No Shortcut — At AMTBA convention in Boston, outgoing president F. H. Habicht said the answer to the sales slump is simply hard work. P. 69

FEATURE ARTICLES

VACUUM POURING

For Flake-Free Forgings — A practical vacuum pouring technique is turning out 120-in. diam, 250-ton steel ingots to get sounder, cleaner, stronger forgings. The set-up consists of two huge degassing chambers. A system of steam jets boosts the vacuum to cut hydrogen content. P. 81

HIGH-STRENGTH TITANIUM

With Good Weldability—A new Ti-3Mo-0.25Be alloy gets its high strength in age or dispersion hardening. Because of low alloy content, it offers greater promise for producibility to close dimensional tolerances. P. 84

DIE-CUT ADHESIVE FILM

Bonds Iron to Aluminum—Premixed film adhesives insure bonds of uniform thickness without mess or waste. For one firm, it solves a production problem in joining dissimilar metals. The sheet ad-

hesive die-cuts readily to match holes in parts. P. 88

GIRDER WELDING

Production Line Steps Up—New methods are speeding bridge fabrication. One firm with the courage to break away from old methods has set up handling and welding steps for high output. P. 90

MISSILE FASTENERS

Are Specs Set Too High? — Fasteners can create costly bottlenecks in crash missile programs. Before going down the line with materials, see if standard types won't do just as well. Stock fasteners can mean big savings in time and money. P. 93

MARKETS & PRICES

BUYING EFFICIENCY

It Is Measureable—Formulas for checking purchasing efficiency are reported by several firms. One method has aided a company in forecasting cost increases as far in advance as 12 months. P. 47

NEXT WEEK

SATELLITE TEMPERATURES

The Art of Controlling—Making sure an orbiting satellite doesn't get too hot or too cold typifies the problem facing producers of space-age hardware. Next week's feature will cover techniques in preparing a satellite for extreme temperatures. (U. S. Navy photo.)

FASTENER PRICING

Reform Proposed—At least one major producer is planning to revamp its entire fastener pricing set-up. The present confusion was brought to a head by recent price cuts. P. 51

NEW MISSILE MARKET

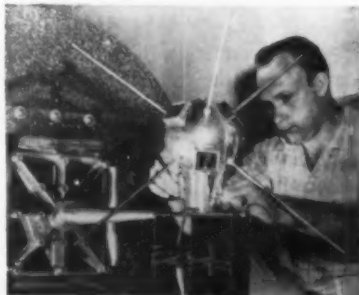
Selling Ground Support Items—Farwest firms are cashing in on a new source of sales—ground support equipment for aircraft and missiles. GSE items are more expensive and complex than missiles themselves. P. 66

MILLS LOOK AHEAD

Steel Outlook in '59—The mills are writing off 1958 as one of the worst in more than ten years. But they look for a definite pickup next year despite strike talk. P. 115

HAND TOOL SALES

Signs of Revival—New products are helping stimulate sale of industrial hand tools, makers say. Buyers can still count on fast delivery, but market may tighten. P. 116





B&W's Mr. Tubes helps you engineer for profit

When your application involves steel tubular products, B&W's Mr. Tubes can help you *engineer for profit*—help you reduce costs and make a better product. Here is the reason why you should make him a member of your product-planning team:

Mr. Tubes, your local B&W district salesman—is thoroughly qualified to help you select the *one* tubular product best suited to your fabricating operations and end-use applications. For instance—in the case of a heat exchanger—should the tubing be seamless or welded? Single length or center welded for unusually long length? What about tolerances? Grade of steel? Mechanical properties and heat treatment? Standard or special specifications?

These are but a few of the many factors involved in determining the right tube for a job. Next time you are planning a product in which tubing is used—call in Mr. Tubes. He can be a valuable member of your team. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.



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Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals.

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and outstanding

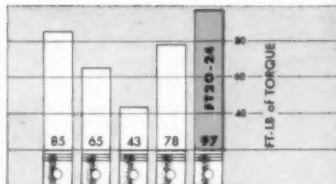
...ON FOUR BIG COUNTS

ALLIS-CHALMERS
FT20-24

2,000-LB
LIFT TRUCK



OUT-POWERS . . . with full 35 hp — the most in its class. Better yet, it's honest *industrial* engine power — built to develop high torque at *usable* working speeds for lift trucks.



The engine in the new FT20-24 develops 97 ft.-lb. of torque.

OUT-MANEUVERS . . . operator steps onto the clean, open platform from either side . . . works comfortably on a wide, cushioned seat . . . spots loads quickly with responsive finger-tip controls . . . turns sharply . . . can have the advantages of optional POWER SHIFT torque converter drive . . . *moves more* day after day.

OUT-CLIMBS other 2,000-lb trucks . . . is sure-footed and tough. Just watch it take steep grades up to 40 percent, loaded. It has extra power, balanced weight distribution and greater lateral stability.



The FT20-24 with full load, will climb a 40% grade.

OUTLASTS . . . bonus strength from mast to rear counterweight keeps it on the job far beyond the usual life expectancy for lift trucks. There is no unnecessary strain on working parts. With automotive-type frame, the engine and drive components are not required to serve as structural members.

Further, the machine can be prepared for service in seconds — stripped for overhaul in minutes — and returned to work hours, even days, sooner than most machines.

How about a demonstration! Let your Allis-Chalmers dealer *show* you how the all-new FT20-24 can out-perform, and bring substantial savings in material handling costs. Send for NEW, FREE Booklet BU-485. Allis-Chalmers, Milwaukee 1, Wis.

BH-86

ENGINE: Industrial-type — Gasoline or LP Gas
Displacement 133 cu in
Horsepower 35 at 2,400 rpm
Torque, ft.-lb 97 at 1,400 rpm

GRADABILITY:
Truck will climb with full load 40% grade

DRIVE:
Standard or (optional) POWER SHIFT with torque converter

LIFTING:
Standard lift 131 1/4 in.
Lifting speed, loaded 50 fpm
Tilt angle 10°

Compare Performance . . .
Compare FT20-24 Specifications . . .
Compare Price!

DIMENSIONS:
Length to front face of forks 69 in.
Width, maximum 32 in.
Minimum intersecting aisles truck negotiates 53 1/2 in.
Turning radius, outside 62 in.

TIRES:
Drive 18 x 5 x 12 1/2 in.
Steer 16 1/4 x 4 x 11 1/4 in.

ALLIS-CHALMERS



A new problem facing steel users today

The danger of losing money by relaxing inventory controls

When the slump set in last year, big inventories were one of the toughest problems for most companies.

Now, as the economy swings back, these problems may seem to have disappeared. Actually, the problems of inventory cost and risk are always with us—just as much a threat to profit in good times as in bad.

But with the urgency of strict economies reduced, there is a very real danger that many companies will be caught off guard—a danger that recession-born practices will be abandoned as temporary emergency measures without careful enough analysis of their profit potential.

For example, companies that modified their steel inventory policies to avoid long-term commitments found that many costs were reduced and their needs better served. By taking advantage of the stocks offered by steel-service centers, these companies were able to release working capital for more productive purposes, free valuable storage space, reduce handling costs and lower scrap losses, insurance, taxes, etc.

Proof in dollars and cents

Those who carefully weighed all the advantages found reason for a *permanent* modification of their previous buying practices. They proved to themselves that they could and should rely

much more heavily on steel-service centers because it makes sense in dollars and cents.

This conclusion is especially sound when you consider the unusually broad scope of Ryerson stocks and the speed and dependability of Ryerson services. Any kind, shape and size of steel can be shipped to you from Ryerson in a matter of hours. And your steel can be furnished in ready-to-use form, saving time and initial-cutting cost. You gain complete flexibility to meet quick shifts in production schedules. And you have the added assurance of getting steel of uniform, high quality—the unequalled dependability of Ryerson *certified* quality.

Your Ryerson representative is well qualified to review the facts and help you get the maximum value for your steel buying dollars. Ask him to analyze your requirements with you the next time he calls.

What it costs to carry inventory

IRON AGE magazine says: "A survey of eight plants shows that, for every \$100 worth of materials bought, the average yearly inventorying cost is \$19.37."

Other authorities say the real cost of steel placed in inventory for extended future use may be as high as 40% more than the invoice price.



RYERSON STEEL®

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Principal Products: Carbon, alloy and stainless steel—bars, structurals, plates, sheets, tubing—aluminum, industrial plastics, metalworking machinery, etc.

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Politics Is Tough Stuff

Make no Mistake About That!

This is the third do-it-yourself piece on "you and politics." But don't go away. The way it sounds coming from some writers and teachers, it is a cinch for a businessman to become a politician, or to help the "party," or to order up information to be given to others. Nothing could be farther from the truth.

It is a hard, tough game. It calls for loss of some dignity at times—at least that type of dignity which rests upon a questionable base. It calls for a dedication and loyalty that seems to be lacking in one of the major parties.

Just for instance: The United Steelworkers of America recently placed an ad in some papers entitled "Plan for Future Prosperity." It is a slick job. It promises the moon and it asks its readers to help reach for this green cheese.

Cut taxes for lower income groups, reduce excise taxes, build public works, build public housing and schools, provide economic aid for distressed areas, and increase the Federal minimum wage—these are the basic points that Dave McDonald asks readers to support. And he asks for Government action for this "prosperity" plan.

Now how would you answer that one? Would you quote economic chatter? Would you give a

long-haired speech on free enterprise? Would you attempt to answer these demands with facts? And if you did, would they be dry facts or would you dress them up? Finally, how do you answer such never-never-land pieces of half-truths and in some cases, outright fairy tales.

Of course the American people want all that the steelworkers want. But everything has a price. You can't get anything for nothing. Nor can each of us have everything he or she wants. It sounds nice and it is difficult to shout down, argue down, or defeat. Old Mother Government is often a substitute for facing reality.

If you go into politics, take this ad as your lesson for the day. Remember, it is hard to vote against Santa Claus despite rumors that the public is "fed up." So far, not enough are "fed up." And that's where your part comes in.

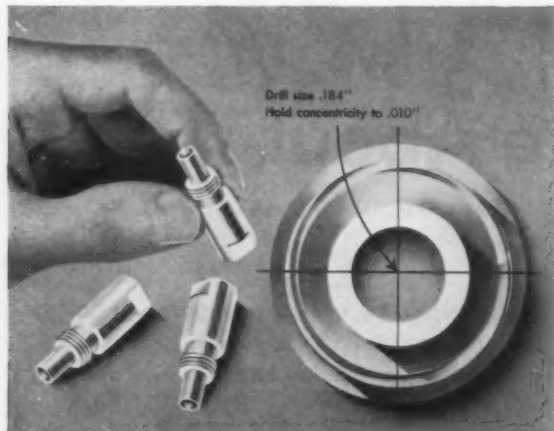
It's a tough, long, hard game; but the work is worth it and so is the goal. The businessman's side must be told—in everyday rough and tumble language. That means telling the voters in a convincing manner that they can't have Dave McDonald's green cheese without paying for it. But in telling them, you better have an alternate plan that has more sense—and appeal—than his.

Tom Campbell

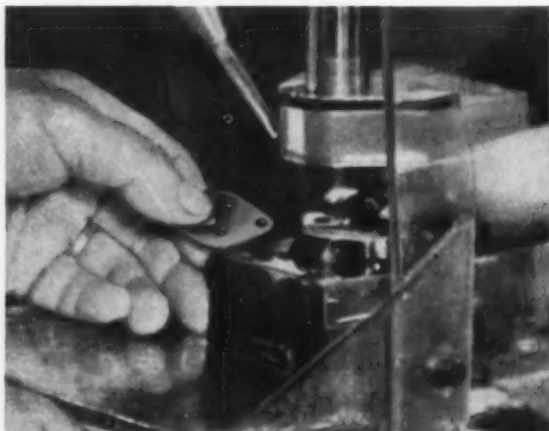
Editor-in-Chief

THE RIGHT METAL

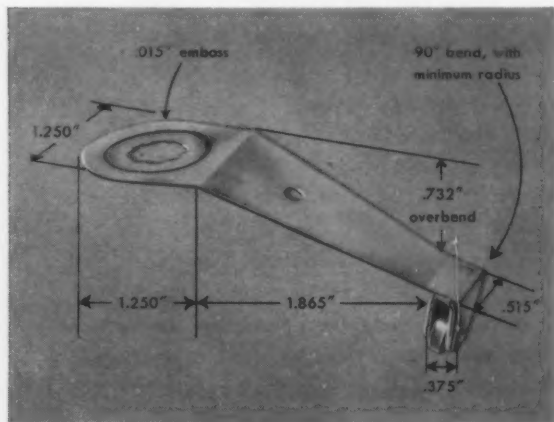
often costs less, may give you surprising savings in fabricating time and cost. Talk to the Man from Anaconda about matching metals to your specific needs, today.



BRASS ROD WITH A SLIGHTLY HARDER CORE than standard rod eliminated rejects (that had run up to 15%) for M. J. Grass Screw Machine Products Co., Buffalo. With standard rod, in drilling a deep hole on multiple spindle machines, the drill tended to wander past the concentricity tolerance.



LEADED COPPER STRIP (machinability rating 80%; conductivity, 99% IACS) boosted production, cut over-all costs 25% for True-love & Maclean, Waterbury, Conn., in making power transistor bases. Adequate production with ordinary electrolytic copper would have called for new equipment investment.



SUPERFINE-GRAIN PHOSPHOR BRONZE eliminated fractures in forming complex variable voltage tap springs (above) used in Lionel's Trainmaster transformers. Lionel had considered substituting a costlier alloy but Duraflex* did the job at no extra cost.

*Anaconda superfine-grain phosphor bronze.



PAY-OFF BARRELS with big coils of brass wire cut down-time 90% at wire forming machines for West Haven (Conn.) Buckle Co. Machines making surgical buckles had used light coils for free pay-off; new coils had to be fed in about every hour.

FROM a base of 93 standard alloys, The American Brass Company can provide an almost unlimited number of combinations of useful properties. It may take only a minor variation in fabrication or annealing in your present alloy to make the metal fit your need exactly. Or you may need another alloy—perhaps one that is less familiar to you because it has had such highly specialized application. So when new or unusual problems arise, ask for the help of our Technical Department. See your Anaconda representa-

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LETTERS FROM READERS

Economic Judo

Sir—This is in response to your article —“Sold to the USSR for \$19,040!”

I can't help thinking that economic judo ought to be employed. It just doesn't make sense to let the Reds dump all of that tin at giveaway prices without buying it. On the other hand allowing it to ruin the Bolivian market also seems wrong. Let's keep them from wrecking Bolivia and at the same time take away their tin whenever they want to give it away.

Let's encourage the government to buy up such surplus material and stockpile it. By taking it off the market we could apply economic judo. By getting it off the market our government could help stabilize prices.—K. D. Love, Exec. Vice Pres. & Sec'y., The Colonial Foundry Co., Louisville, O.

▪ Let's let our congressmen hear about this.—Ed.

Management's Story

▪ In a recent editorial (Oct. 16 issue), Editor-in-Chief Tom Campbell pointed out that “so far labor leaders and their spokesmen have an



“I'm looking for a desk job.”

THE IRON AGE, October 30, 1958

edge on management when it comes to getting the story across.”—Ed.

Sir—There is no question but that the unions have the edge when it comes to publicity. All you have to do is look at any of the local newspapers in any city and you will find large headlines of what “so and so” says, who represents the union.

And invariably you'll find a small two- or three-line paragraph at the bottom of the column quoting the representatives of management. It would seem to me that management has been either afraid or indifferent in standing up to fight these accusations.

Labor unions now have such a head start over management it will require a hard, steady, uphill fight to change public opinion.—P. W. Newcomb, Pres., Precision Drawn Steel Co., Pennsauken, N. J.

Kettle Size

Sir—In your issue Oct. 9 we read with interest an item on p. 109, in which it is stated that a new kettle exceeds by more than three feet the longest galvanizing kettle now in operation.

We must take exception to this statement, as in our subsidiary company, Montmorency Corp., Quebec City, we have an electrically heated galvanizing kettle, in operation since May 1958, which is 41 feet in length and which we consider the largest in operation.—E. F. Noel, Mgr., Vice-Pres. & Gen'l. Mgr., Cobra Industries, Inc., Quebec 2, Canada.

▪ Vulcon Galvanizing Inc., Natrona, Pa., had thought its 40-ft kettle was the world's longest.—Ed.



There's a Satisfied Customer back of most orders for Diamond Perforated Metals

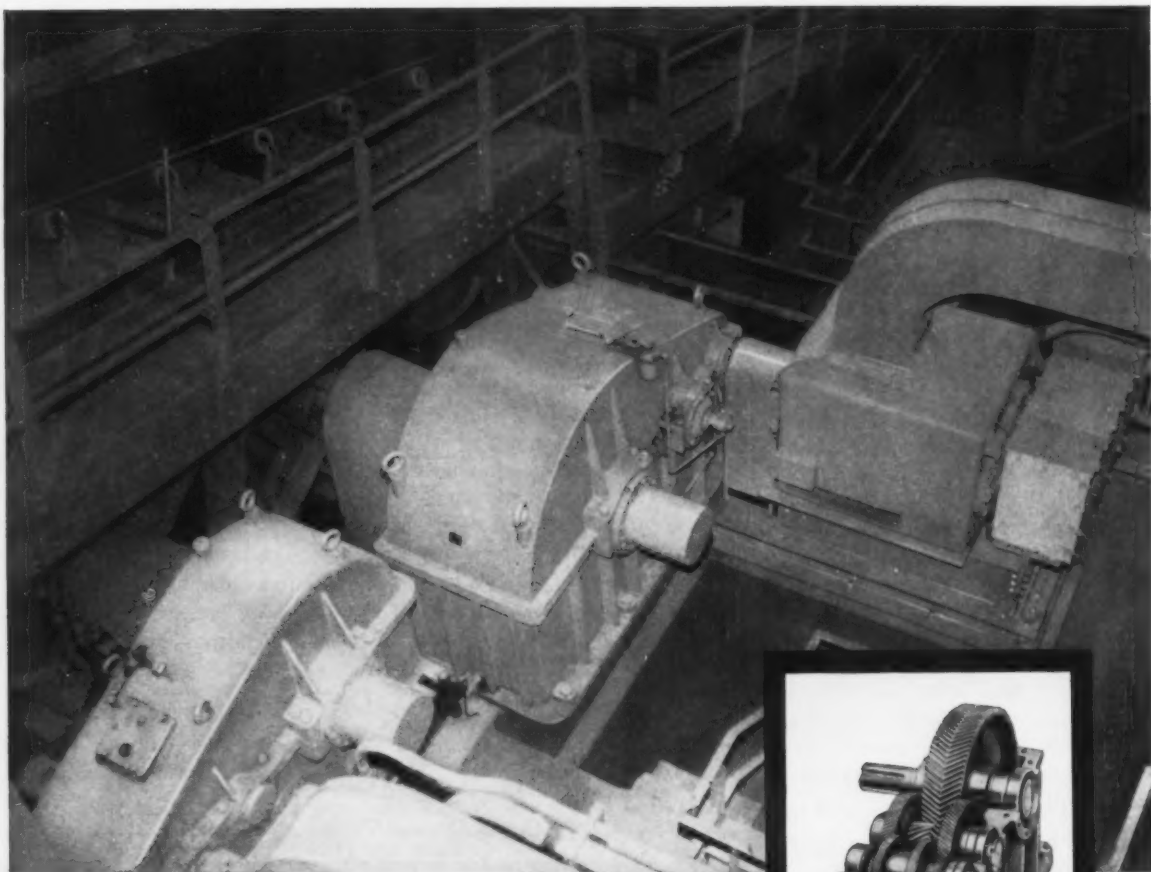
Naturally, we're always glad to make new friends and open up new accounts but, more and more as time goes on, the greater part of our business comes from concerns that have dealt with us before—some of them for nearly half a century.

One Reason is because they have learned that Diamond Perforated Metal Products are always reliable and our charges in line with competition of comparable quality. Another Reason is because our facilities are so complete, and our stock of dies so extensive, that almost any demand for perforated metal sheets, plates or parts can be taken care of promptly, accurately and economically.

ALL inquiries receive prompt attention. Illustrated catalogs give helpful working data—show many modern applications—enable you to select the best pattern for any particular purpose.

DIAMOND MANUFACTURING CO., WYOMING PENNA.
(Wilkes-Barre Area)

New Bulletin No. 47, Describes DIAMONTEX Perforated Metal Lay-in Panels for Modern Acoustical Ceilings.



**PHILADELPHIA REDUCERS ARE
HEAVY DUTY "PLUS"...**
and the big jobs prove it!

The big jobs, like these 1,500,000 inch-lb. output torque units in a taconite processing plant, are the ones that demand the extra "plus" in reliability and performance of Philadelphia Parallel Shaft Reducers.

In reliability, Philadelphia Reducers are the "heavies" of the heavy duty drives, with extra strength built into every part. Housings are reinforced at points of greatest stress. Bearings are extra heavy to take severe and repeated shock loads . . . handle heavy overhung loads. Shaft alignment is accurate, and shafts have that extra "heft" that keeps them running true.

In performance, these reducers have no equal. Gearing is designed to the needs of each application and symmetrically arranged in the housing. Hence, bearings on each

shaft carry equal loads, shaft deflections are minimized, bearings and gearing have higher shock load capacity.

In value, a Philadelphia drive assures long rugged life and freedom from dollar-eating maintenance problems. Pound for pound, horsepower for horsepower, dollar for dollar you can't buy a reducer that will outlast a Philadelphia.

Philadelphia Parallel Shaft Reducers are available in single, double and triple reductions for ratios of 1.25:1 to 292:1. Write today for your copy of catalog H-58.

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INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS

Molten Aluminum

Ralph Eshelman, our Engineering Editor who headquarters in Detroit, is a conscientious, hard-working reporter. This week he applies those talents to a story on a significant trend in metalworking. It's the location of a primary metals producer (in this case Reynolds Aluminum) right next to a user industry (in this case Ford Motor's Listerhill, Ala. casting plant).



This twin plant trend was predicted by an IRON AGE story early in 1957 which noted, "when the next big aluminum reduction expansion is announced, look for a big customer to move in next door as a ready market for hot metal."

For an up-to-date view of this trend in hot metal use and what it means to aluminum we recommend Ralph's story on p. 43.

When not slaving over a hot typewriter one of Ralph's hobbies is deep sea fishing. And that explains the photo. Ralph's angling skill brought in the six foot plus sailfish on the right during a recent Florida trip. Afterwards the big problem was convincing his wife it was worth \$130 to have the sea's prize stuffed and shipped home.

Prime Predictor

Back in Sept. 1957 Editor-in-Chief Tom Campbell wrote an article on labor. In it he made some predictions for the labor movement in general and for Walter Reuther.

As usual Tom's battling average was excellent. For labor generally he hit at a .777 clip. He called the turn on laws restricting use of pension funds, indicated congress would not pass stringent labor legislation.

Tom's predictions about Reuther were even better. He batted 1,000 in that area. Among other things he predicted Reuther's UAW would not get a 32-hour week, but would get a moderate wage increase for mass production workers.

New Puzzler

Many thanks to R. Lantos for this one:

Over the top of a fence is placed a rope, the same amount on both sides. The rope weighs $\frac{1}{3}$ pound per foot. On one end of the rope hangs a monkey holding a banana, and on the other end is a weight equal in weight to the monkey.

The banana weighs 2 ounces per inch. The length of the rope (in feet) is equal to the age of the monkey, and the weight of the monkey (in ounces) is as much as the age of the monkey's mother. The combined ages of the monkey and its mother are 30 years.

The weight of the banana plus one half the weight of the monkey is one quarter as much as the sum of the weights of the weight and the rope, where all weights are in the same units.

The monkey's mother is one half as old as the monkey will be when it is three times as old as its mother was when she was one half as old as the monkey will be when it is twice as old as it is now.

How long is the banana?



you can rely on

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when you order

gray or alloyed iron

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DECEMBER 11

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HOW
TO GET MORE FOR
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DOLLAR

NONFERROUS CASTINGS

AN IRON AGE
SPECIAL REPORT
TO MANAGEMENT

Ladle linings last longer with
H-W BLACK PATCH



H-W Black Patch is a plastic refractory made with super-duty fire clay and graphite and effective oxidation inhibitor.

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- H-W Black Patch makes a joint-free monolithic lining of very high refractoriness.
- H-W Black Patch develops a strong ceramic set upon heating and is exceedingly resistant to erosion.
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COMING EXHIBITS

Plastics Show—Nov. 17-21, International Amphitheater, Chicago. (The Society of the Plastics Industry, Inc., 250 Park Ave., New York 17.)

Power & Mechanical Engineering Show—Dec. 1-5, New York Coliseum. (International Exposition Co., 480 Lexington Ave., New York 17.)

MEETINGS

NOVEMBER

Grinding Wheel Institute — Semi-annual fall meeting, Nov. 5-7, Statler Hotel, Buffalo, N. Y. Society headquarters, 2130 Keith Bldg., Cleveland.

National Metal Trades Assn.—Biennial convention, Nov 5-7, Hotel Commodore, New York. Society headquarters, 337 W. Madison St., Chicago.

National Machine Tool Builders' Assn.—Annual meeting, Nov. 5-7, The Homestead, Hot Springs, Va. Society headquarters, 2071 E. 102nd St., Cleveland.

Industrial Management Society—Annual national industrial engineering and management clinic, Nov. 5-7, Sherman Hotel, Chicago. Society headquarters, Suite 1310, 330 S. Wells St., Chicago 6.

National Tool & Die Manufacturers Assn.—Annual convention, Nov. 5-9, Sheraton Hotel, Philadelphia. Society headquarters, 907 Public Square Bldg., Cleveland.

Steel Founders' Society of America —Technical & Operating conference, Nov. 10-12, Carter Hotel, Cleveland. Society headquarters, 606 Terminal Tower, Cleveland 13.

National Assn. of Aluminum Distributors—Annual meeting, Nov. 10-12, Boca Raton Club, Boca Raton, Fla. Society headquarters, 1900 Arch St., Philadelphia 3.

National Electrical Manufacturers Assn. — Annual meeting, Nov. (Continued on P. 16)



SHOW STOPPER

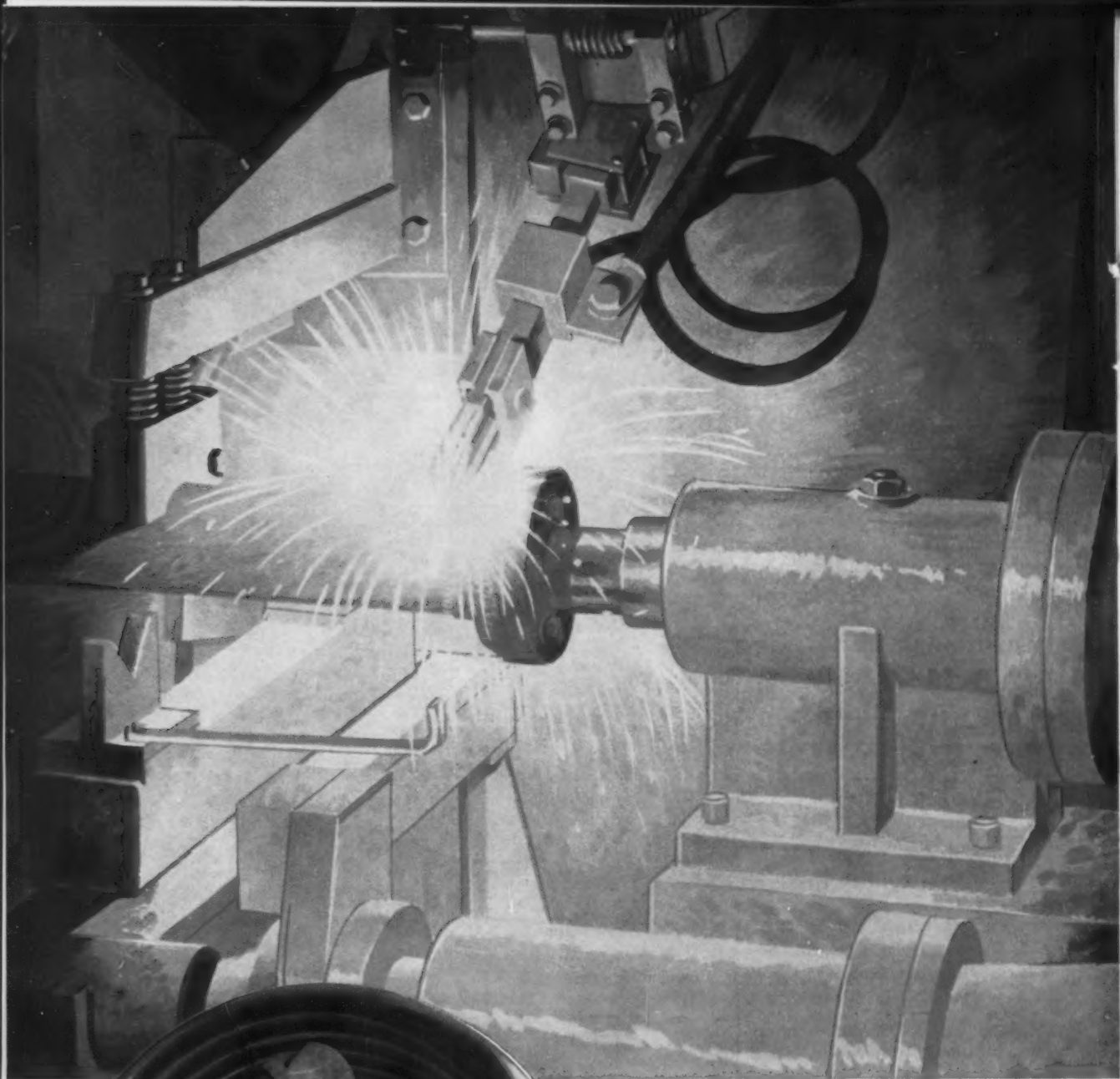
It's the new Torrington Verti-Slide, the first major innovation in the field of 4-SLIDE equipment in 50 years!

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100% duty cycle—Zone 1 price* **\$159**
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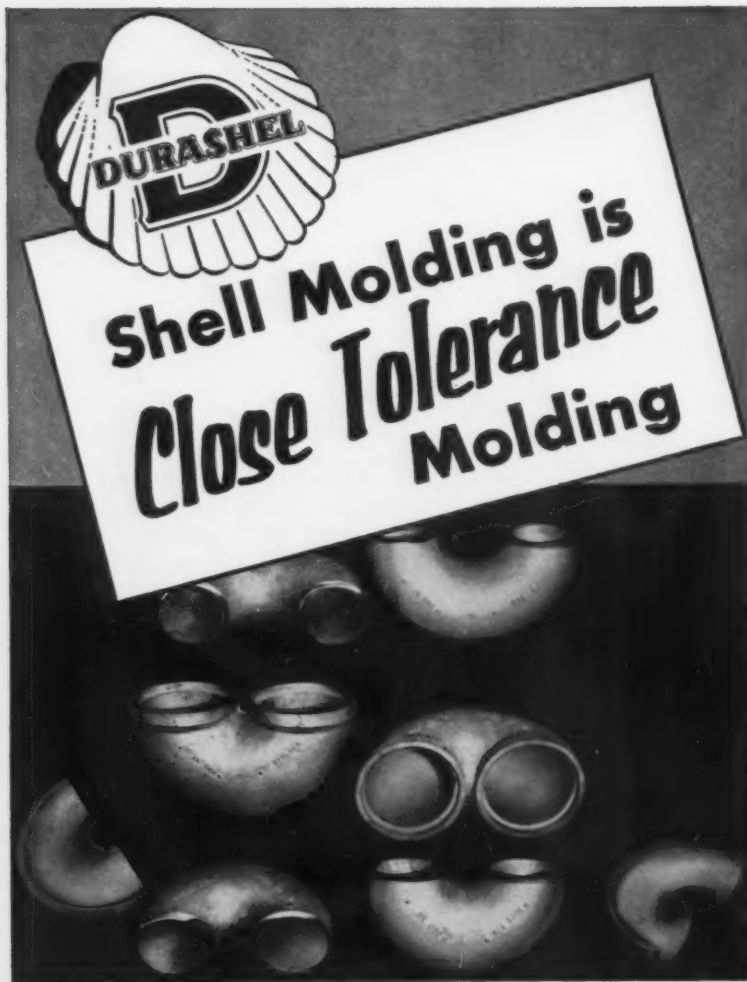


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One of the outstanding values in shell molded castings is the higher precision or close tolerance casting . . . also usually less machining and finishing . . . than when pieces are cast statically. For quantity production it is usually more economical.

We suggest that you investigate shell molding for your high alloy casting requirements. It has much to offer and we have complete facilities for taking care of your requirements. Should other casting methods—static or centrifugal be better, we have these facilities, too.



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CHICAGO OFFICE: 332 South Michigan Avenue

DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

EXHIBITS, MEETINGS

(Continued from P. 13)

10-13, Hotel Traymore, Atlantic City, N. J. Society headquarters, 155 E. 44th St., New York.

Electric Overhead Crane Institute—Engineering committee meeting, Nov. 13-14, Sherman Hotel, Chicago. Society headquarters, One Thomas Circle, Washington 5, D. C.

American Standards Assn.—National conference on standards, Nov. 18-20, Hotel Roosevelt, New York. Society headquarters, 70 E. 45th St., New York 17.

Manufacturing Chemists' Association, Inc.—Semi-annual meeting and winter conference, Nov. 25, Hotel Statler, New York. Society headquarters, 1625 Eye St., N. W., Washington 6, D. C.

Automotive Tool & Die Manufacturers Assn.—Annual meeting, Nov. 26, Fort Shelby Hotel, Detroit. Society headquarters, 103 Pallister Ave., Detroit.

American Society of Mechanical Engineers—Annual meeting, Nov. 30-Dec. 5, Statler & Sheraton-McAlpin Hotels, New York. Society headquarters, 29 W. 39th St., New York.

DECEMBER

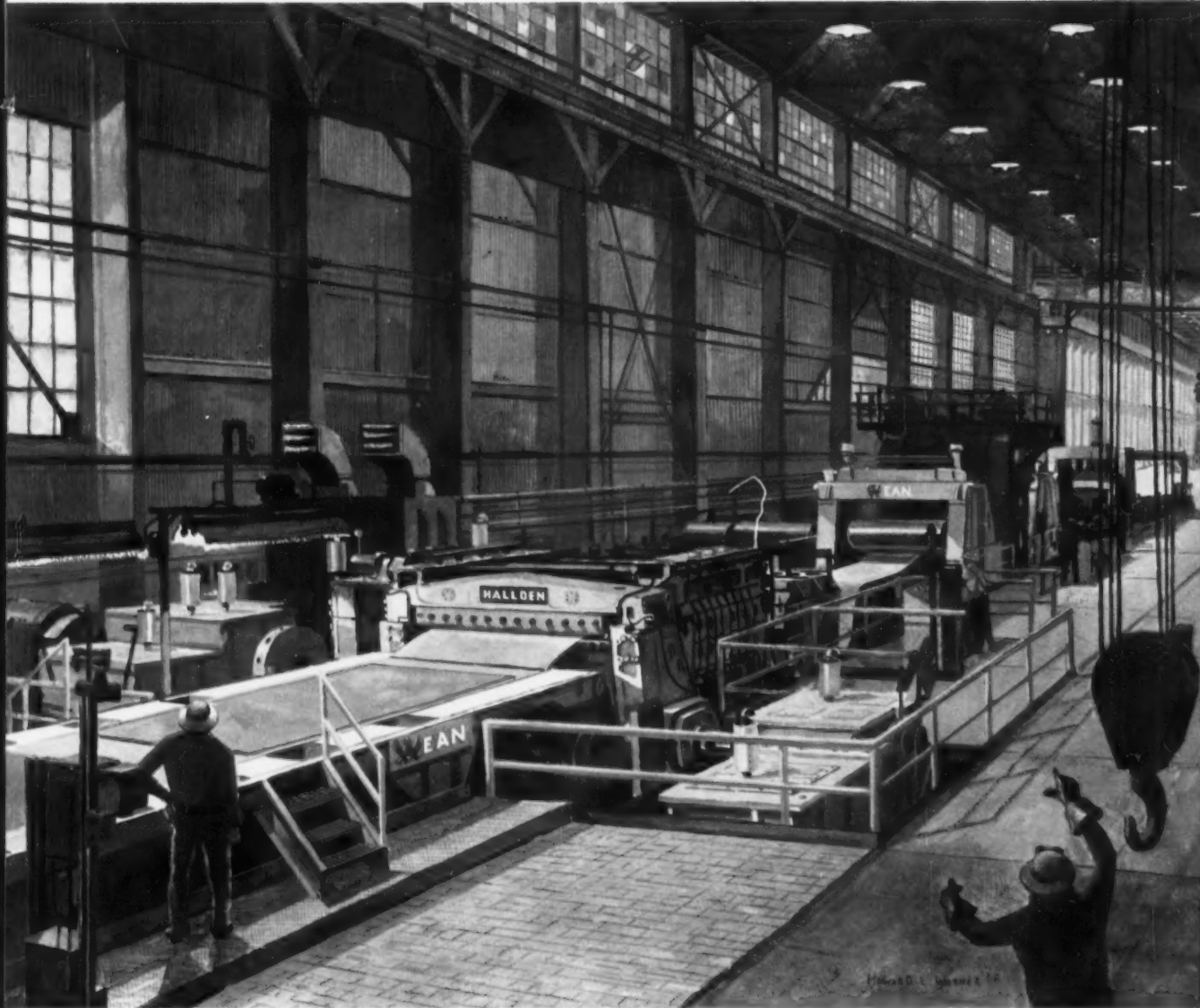
Spring Manufacturers Assn.—Annual meeting, Dec. 2-3, Barbizon-Plaza Hotel, New York. Society headquarters, Box 1440, Bristol, Conn.

The Metallurgical Society of AIME—16th electric furnace steel conference, Dec. 3-5, Hotel Statler, Detroit. Society headquarters, 29 W. 39th St., New York.

American Institute of Chemical Engineers—Annual meeting, Dec. 7-10, Netherland Hilton Hotel, Cincinnati. Society headquarters, 25 W. 45th St., New York.

The Material Handling Institute, Inc.—Annual membership meeting, Dec. 10, Hotel Roosevelt, New York. Society headquarters, One Gateway Center, Pittsburgh.

Wean, "J & L" and Shearing . . .



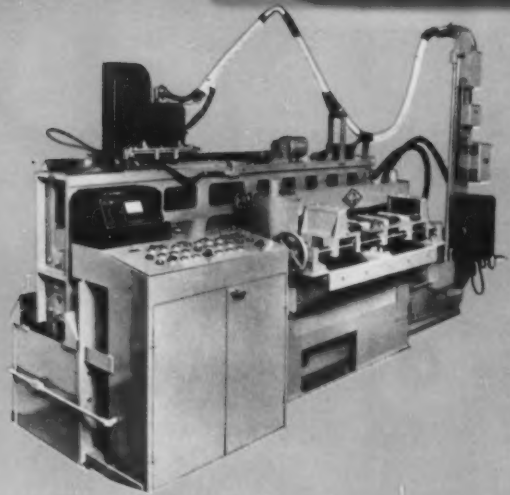
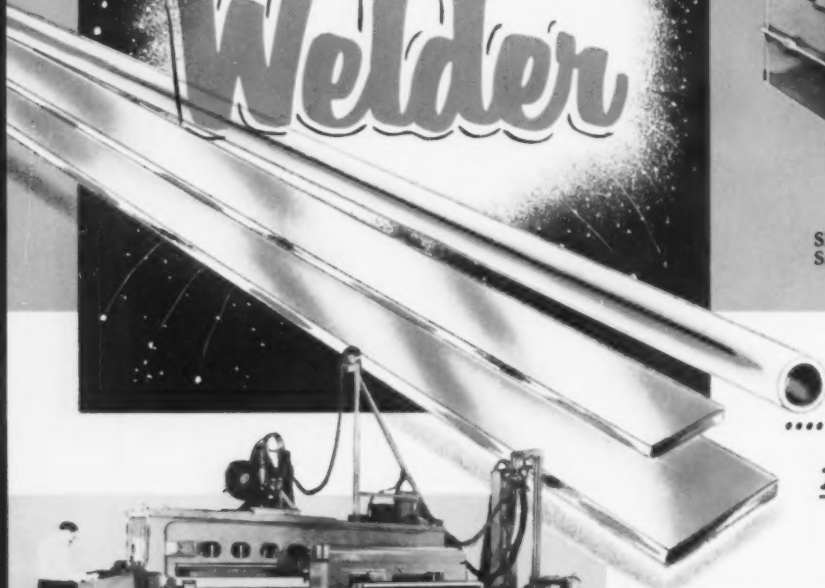
This Wean-Hallden Combination Hot Rolled Shearing Line can best be described as "unique, precise and versatile." Unique . . . since it incorporates a flying shear that will shear strip up to $\frac{1}{4}$ " thick and 74" wide at high speeds with great accuracy. Precise . . . since it is a line engineered of the highest quality components into an automatic production unit of top efficiency. Versatile . . . since its many combinations of shearing, recoiling, slitting, edge trimming and temper passing can produce a great many steel products.

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THE NEW

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CONTINUOUS SILICON
SHEET PRODUCTION

Shearwelder for coil build up line for 42" wide
Silicon Steel from .015" to .030" thick.

*....more automation
for even faster
Steel Production!*

● Metal Processing Machine Company's new Shearwelders are outstanding because of their advanced design incorporating automatically sequenced operations.

Shearing and welding are performed at the same station with positive clamping right at the work area, thereby insuring perfectly aligned butt welds.

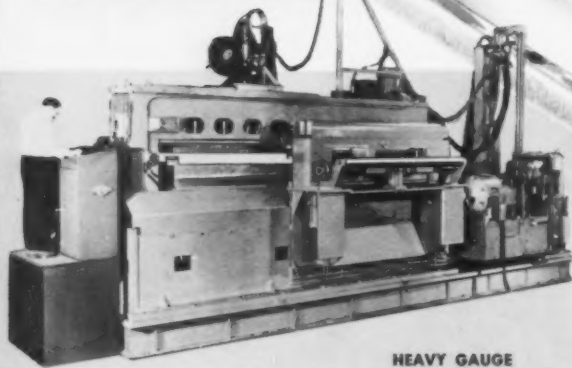
"M.P.M." welds are extremely ductile, permitting subsequent rolling, forming, or blanking operations. Weld joints are smooth and require no trimming.

Rugged construction is insurance for minimum maintenance and compact design saves floor space.

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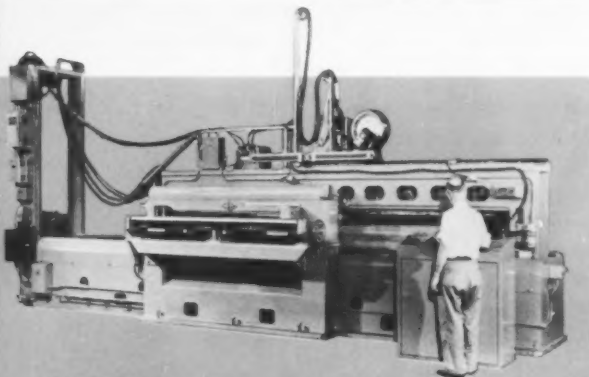
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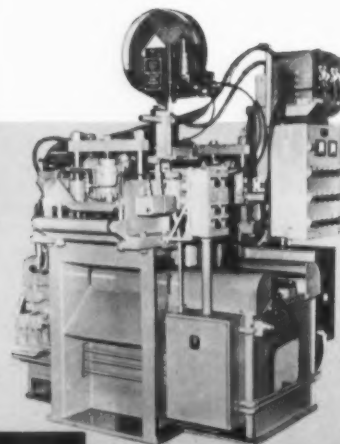
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Shearwelder for butt welding 60" wide x .250" thick
Stainless Steel.



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Shearwelder for Carbon Steel coil build up line for
.015" to .060" thick x 72" maximum width.



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Shearwelder used with
strip looping device for
splicing coil to coil to
permit continuous pro-
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Alcoa puts the metal where you want it

Before you read on, blink your eyes. In the time it took to do that, this man has produced an entire automotive grease gun body—complete with external ribs; solid end; smooth, seamless interior; and go-to-market external finish.

Sound too easy? No! We can make round, oval, square and irregular parts the same way. Finished parts—with the strength of forgings—with tolerances down to plus or minus 0.005"—with a smooth, corrosion-resistant finish of about 125 microinches. A clear case of putting the metal where you want it. The cost of tooling for impacts is

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In impacts, as well as forgings, castings, extrusions and screw machine parts . . . Alcoa puts the metal where you want it. A call to Alcoa can mean fewer rejects or ingenious design solutions . . . less waste in production or a product that sells faster. Start now; write for Alcoa Up-to-Daters, a file of design tips on Alcoa Engineered Products. Aluminum Company of America, 1999 Alcoa Building, Pittsburgh 19, Pennsylvania.



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Here is a combination that has proved itself during three years of field testing. A welcome addition to Roebing's great line of wire ropes, Royal Blue *Herringbone* is both a regular lay and lang lay wire rope!

So, in one rope you have the greater flexibility and abrasion resistance of lang lay construction *plus* regular lay's superior stability under severe operating conditions.

Preformed *Herringbone* is made of two *pairs* of lang lay strands, and two strands of regular lay which separate the two *pairs* of lang lay—all of it made of Type 1105 rope wire.

For three years *Herringbone* has been used for general hoisting, holding and

closing lines, shovel ropes, wagon scraper ropes and dragline ropes. Without reservation, its performance has been superior to that of any other rope used for the same jobs . . . even in the hands of inexperienced personnel! *Its proven capabilities clearly suggest its use for all jobs where steel core ropes are normally used.* See your Roebing salesman for all the facts or write Wire Rope Division, John A. Roebing's Sons Corporation, Trenton 2, New Jersey. Roebing *Herringbone*, the two-in-one rope to meet the *doubly* stringent demands of today's economy.

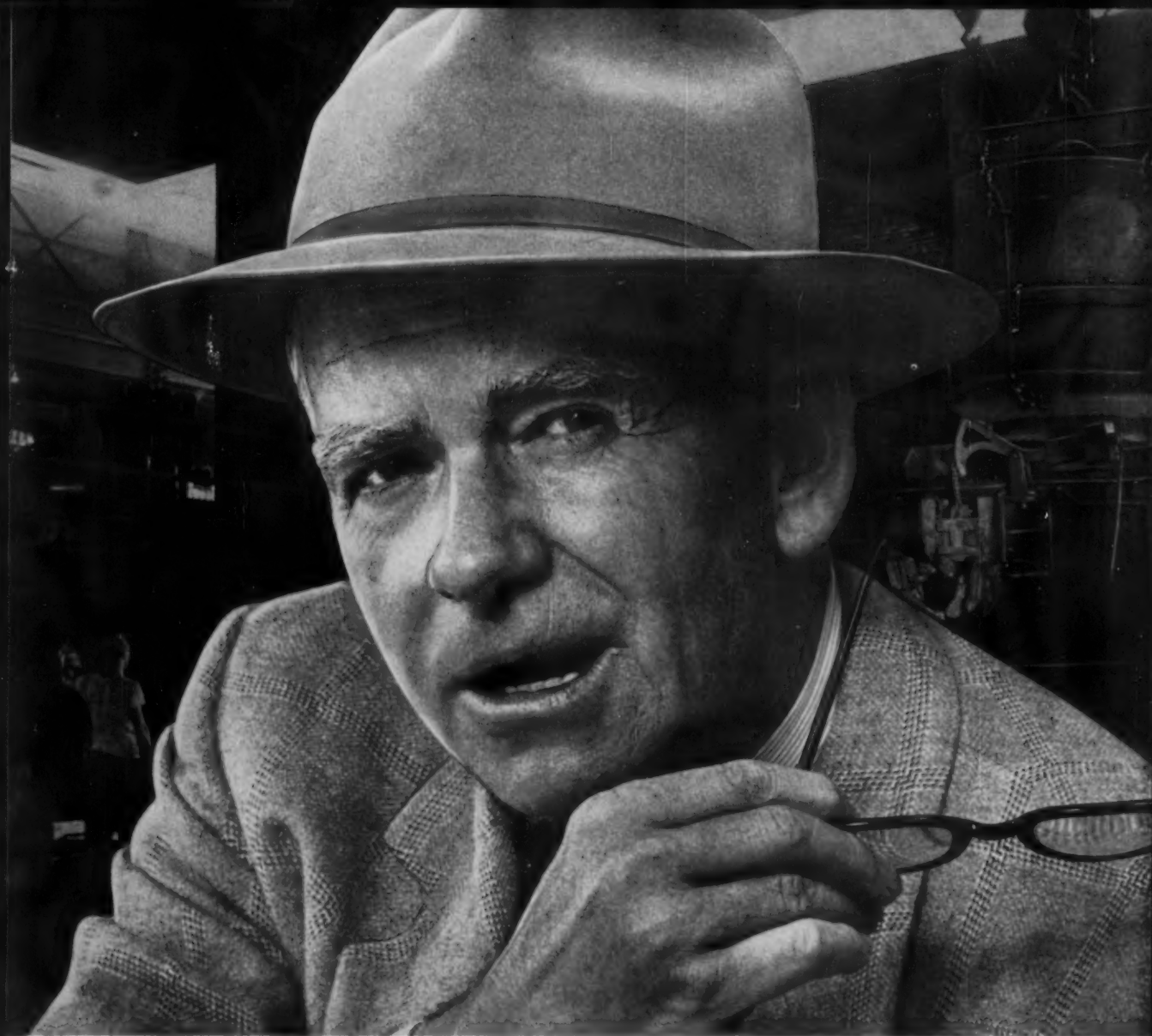
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*Reg. app. for





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Steel mill and foundry operators are cutting chromium costs by using ELECTROMET's new refined charge chrome for all high-carbon chromium additions. Inventory, handling, and storage are greatly simplified by stocking only this one high-carbon chromium alloy. It is ideal for use as:

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Refined charge chrome combines the economy of regular charge chrome with the maximum cleanliness and low residual element content of conventional high-carbon ferrochrome.

For facts on how refined charge chrome can reduce your costs, contact your ELECTROMET representative.

ELECTRO METALLURGICAL COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

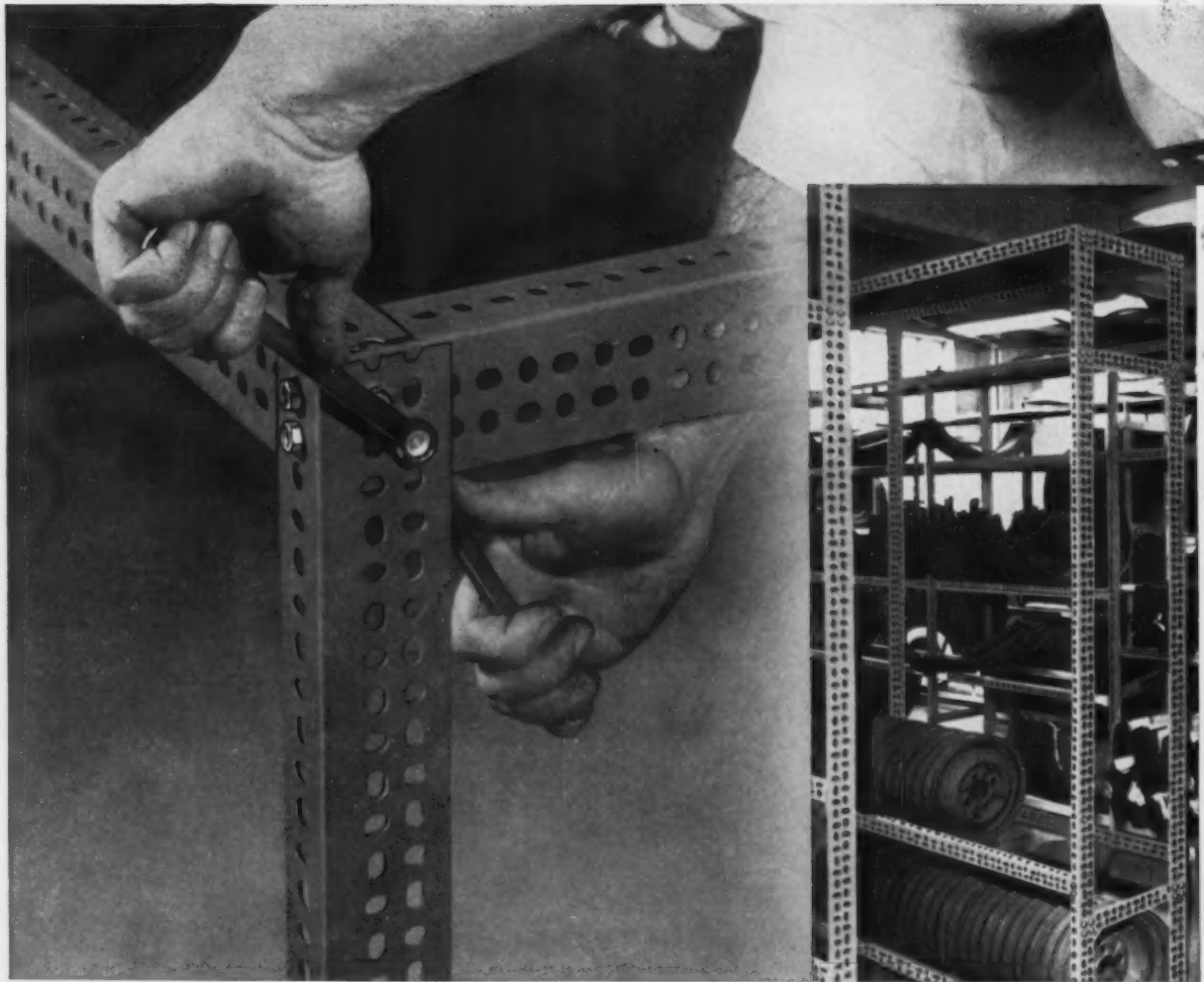


Convenient 20- and 40- pound pigs of refined charge chrome are magnetic, allowing easy handling with an electromagnet.

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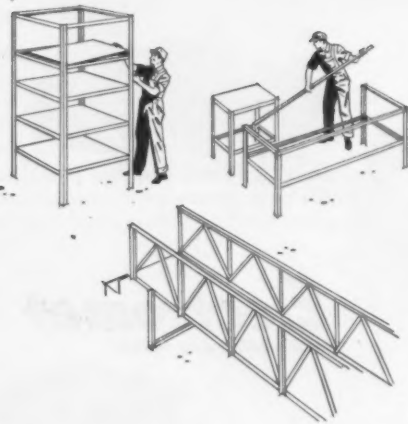


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Save time, space, and money in building storage racks, catwalks, supports, guard rails, special purpose tables, facilities. Call your Republic representative or write for idea-packed catalog.

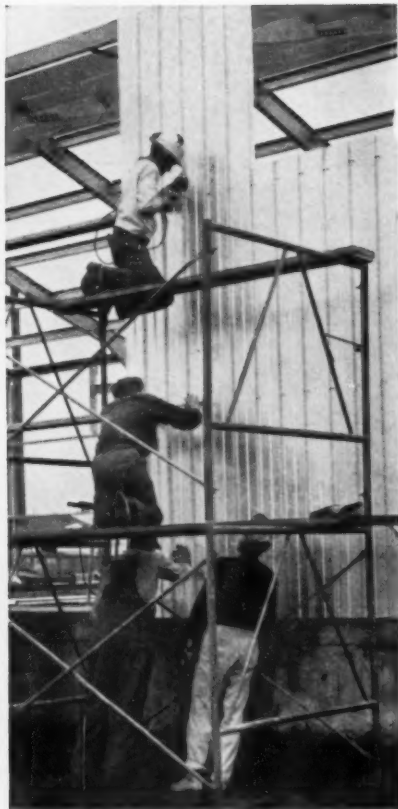
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REPUBLIC WEDGE-LOCK LONG PARTS STORAGE UNITS are easy to load, unload from either side. The heavier the load, the tighter the grip because Wedge-Lock construction includes the three prime essentials of good shelving: 1. A post that will not bend; 2. A reinforced shelf that does not sag; 3. A concealed sway-proof joint. Republic Storage Engineering specialists help you plan. Write today.



REPUBLIC MATERIALS HANDLING SPECIALISTS engineered these steel boxes to the requirements of the Krupp Forge Company, Chicago, Illinois. Special features include corrugated construction for strength, smooth channel around the top to eliminate sharp edges, four-way fork channels to simplify handling, and stacking brackets to permit tiering to any practical height. For materials handling ideas that save space, time, and money, call Republic or send coupon.



TRUSCON "BUDGET BUILDINGS" . . . 3-WEEK DELIVERY from order to job-site! Here's top utility at lowest cost—the fast, easy way to provide industrial housing or to enlarge manufacturing facilities. Truscon "Budget Buildings" are available in widths of 32, 36, 40, 44, and 48 feet—12- and 14-foot heights, in any length necessary. Roofing, siding, windows, doors, hardware shipped as a package. Erection is fast, easy. Send for brochure.

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 Truscon "Budget Buildings"
 Have a Materials Handling Engineer call

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How Purchase Decision Executives Take Part in purchase of Machine Tools & Other Metalworking Equipment

Percentage of each executive group and percentage participating within each group

Industry Base: 100 34 Fabricated Metal Products
Plant Base: All Plants with 20 or more plant workers
Executive Base: All Executives with titles listed below

Executive Group	Total	100%	75%	50%	25%	10%	5%	0%		
Importance of Executive Group (weighted number of executives; Percentage of all 3-5 executives)	2048	100.0	65.7	14.7	20.0	28.5	14.5	206	11.1	9.1
Role in Purchase Decision (All say part in purchase decision)	73.5	68.8	71.6	58.7	67.4	63.2	69.7	59.5	37.4	4.4
Level of Purchasing Responsibility (Executive or part of responsibility; Percent also responsible in other titles; Percent part of buying team; Key executive contribution)	41.7	39.6	44.4	47.4	46.7	74.4	45.3	37.4	12.1	1.1
Specific Role in Purchase Decision (Initiates type of product; Approves title of product; Reviews product specifications; Initial supplier; Executive or major contributor)	59.9	47.9	42.0	50.2	70.3	61.5	60.5	44.4	6.6	0.4

44.7% of all purchase decision executives in 100 34 plants with 20 or more workers have copies of formal titles. 25.0% of these copies of formal titles are titles in purchase of machine tools and other metalworking equipment.

NEW IRON AGE PURCHASE-DECISION STUDIES identify buying-specifying team for seven major types of metalworking equipment, four types of components, three materials, and engineered products and services. Data is based on probability sampling, analyzes purchase-decision roles of metalworking executives by title, primary function, and multiple function—by industry and by plant size.

How Purchase Decision Executives Take Part in purchase of Metal Cleaning & Finishing Equipment

Percentage of each executive group and percentage participating within each group

Industry Base: 100 35 Primary Metals
Plant Base: All Plants with 20 or more plant workers
Executive Base: All Executives with titles listed below

Executive Group	Total	100%	75%	50%	25%	10%	5%	0%
Importance of Executive Group	107	100.0	74.0	48.0	31.0	11.0	6.0	0.0

How to Increase Your Sales Efficiency in Metalworking

New IRON AGE purchase-decision research tells you how metalworking buys... identifies buying-specifying team... shows influence of each executive function

If you know the industries that comprise your metalworking markets, as well as their relative importance and location,* you are well on your way to getting more for your marketing dollar in metalworking. To complete the picture, however, you need to know how each industry buys and also which executives are influential in purchase decisions.

This information is now available to you in the IRON AGE's new ARF-appraised National Analysts Studies of Buying Influences in Metalworking. This authoritative data—compiled by one of the country's leading research organizations—identifies, by industry and plant size, the buying-specifying team for each of 15 major product categories sold to metalworking. Also it analyzes the relative influence of various executive functions on purchasing decisions. Thus it pinpoints the executives you must presell for successful marketing—many of whom cannot ordinarily be reached by your salesmen.

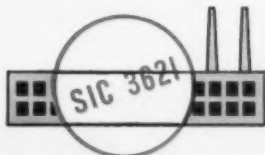
Based on probability-sampling techniques and interviews in depth with 2211 executives in

596 plants, this new IRON AGE research data provides definitive purchase-decision patterns for the metalworking plants doing 94% of the buying—those employing 20 or more plant workers. Data is presented in detail to show the extent to which executives participate in purchase decisions, the level of their purchasing responsibility, and specific roles played in purchases. It is analyzed in terms of title, primary function and multiple function, as well as by 2-digit industry groups and plant size.

These buying-influence studies are just one of the tools available to you under the IRON AGE's new Marketing Assistance Program designed to help you carry out the four steps below in meeting today's profit squeeze and preparing for tomorrow's new wave of expansion. For complete details, contact your IRON AGE representative.

*For help in classifying prospects and customers by new 1957 SIC codes, evaluating your metalworking market potentials, and pinpointing major sales targets, ask about IA's new Master List of Plants in Metalworking and Basic Marketing Data.

How to Get More for Your Marketing Dollar in Metalworking



1. Identify the industries that make up your markets



2. Evaluate market potential of each industry



3. Gear sales efforts to market potential



4. Increase sales efficiency by preselling buying-specifying team

The **IRON AGE**

A Chilton Publication

Chestnut & 56th Sts., Philadelphia 39, Pa.





Boosts production of gas oven thermostats 11½% using Gulfcut **GULF MAKES THINGS**

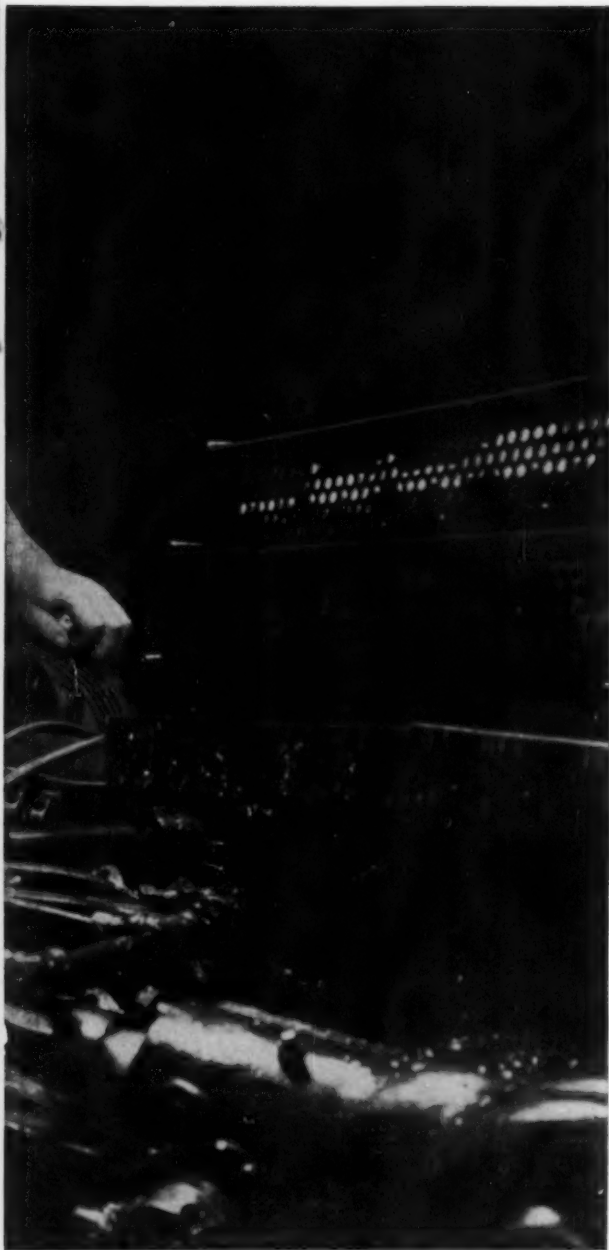
What makes a gas oven thermostat "tick"? The "brain" of the thermostat is a complex valve-control assembly requiring precision machining.

The Wilcolator Company, Elizabeth, New Jersey, turns out thousands of these units a day . . . using Gulfcut 11D Cutting Oil exclusively in the machining of aluminum bodies and plugs for these assemblies.

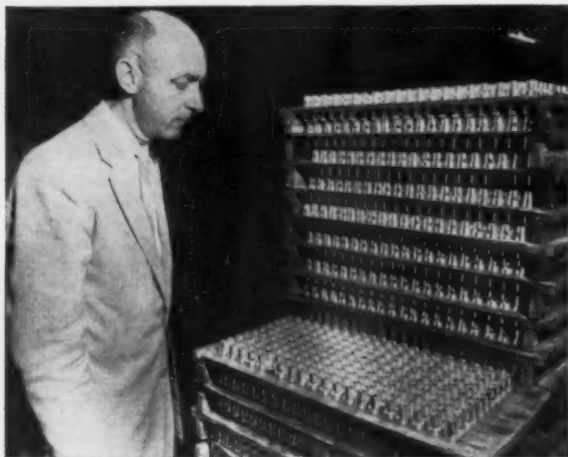
"We've experimented with a number of different cutting oils on this operation," says Lester C. Stork, Vice

President of Manufacturing at Wilcolator. "But only Gulfcut 11D gives us the 20 micro finish we need on certain critical parts. What's more, it helped us increase production by 11½%.

"Better finish and increased production are only part of the story. We like Gulfcut 11D Cutting Oil because it doesn't stain our machines, or contaminate the solvent in our de-greaser. It's safer to work with, too, because of its high flashpoint."



This Heald machine finishes 3 bodies and 3 plugs simultaneously every 19 seconds. Taper cuts are made at 2000 rpm with a feed of .00212. Wilcolator uses Gulfcut 11D cutting oil on this and all other aluminum machining jobs.



Gulf man sees proof that Gulfcut 11D helps Wilcolator get top results in their most critical machining operation. Jacques Schindler, Gulf Sales Representative, notes the perfect finish and the exact fit of the tapered plugs to the bodies.

◀ This 10-spindle Kingsbury automatic drilling and tapping unit machines critical holes in the body of the control valve. Gulfcut 11D was found to be the only cutting oil to give Wilcolator the 20 micro finish required on this surface.

Cutting Oil... more proof that

RUN BETTER!

How about your operation? Do you machine non-ferrous metals? Non-staining, non-corrosive Gulfcut 11D was developed especially for this use. Try it in your plant. Whatever type of machining you do, there's a shop-tested cutting oil to meet your specific needs in the complete Gulfcut line. See how Gulf makes things run better. Call a Gulf Sales Engineer at your nearest Gulf office, or mail coupon today for illustrated literature on Gulfcut Cutting Oils.



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City _____ Zone _____ State _____

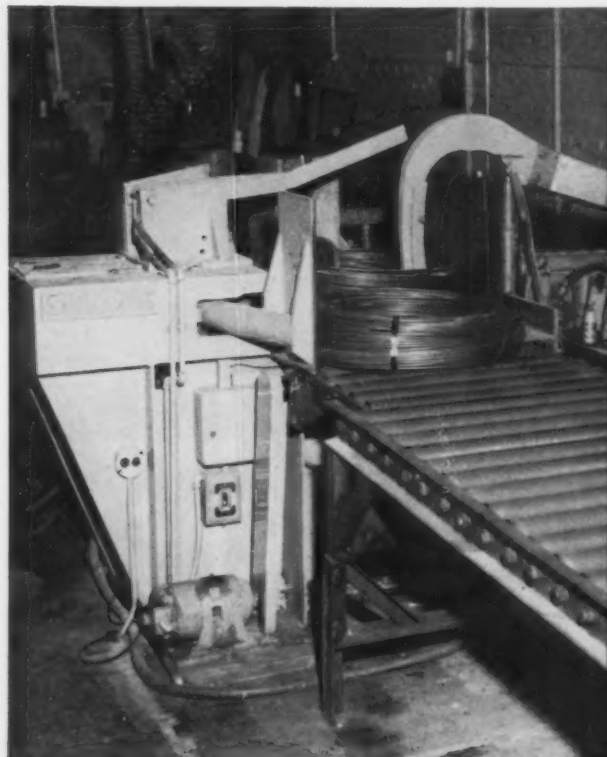
IA-0234



This completely automatic nail carton strapping machine has been in operation since 1955. Semi-automatic machines of this type have been in steel mill operation since 1946.



Three men tie 800 rod or wire coils in one shift, 3 straps per coil, with this MH11 automatic machine. Signode wire coil strapping machines have been in use since 1949.



This machine was installed in 1954. Coil after coil is tied tight, quickly. Coils are more compact, are easier to handle, take less space in storage and in transit.



One man straps an average of 600 strip coils in 8 hours with this machine, which also tightens coils and squares up edges. Similar Signode machines have been in use since 1948.



This MH10 push-button strapping machine has been strapping *hot* coils—1200° F.—dependably since 1953, at a rate of 120 coils per hour, 3 straps per coil.



Operator selects number of straps and strap position for coils of various sizes. Here, coils are also automatically stacked on pallets and up-ended for lift truck handling.

**These Signode machines are proved
...by 12 years of dependable operation
...by rugged service in 73 steel mills**

You don't need to gamble when you're considering automatic strapping equipment. The dependability and high production per man-hour of Signode machines has been proved by as much as 12 years of operation in the hardest kind of steel mill service... often in around-the-clock production where downtime would have been extremely expensive. If you count on savings, depend on Signode.

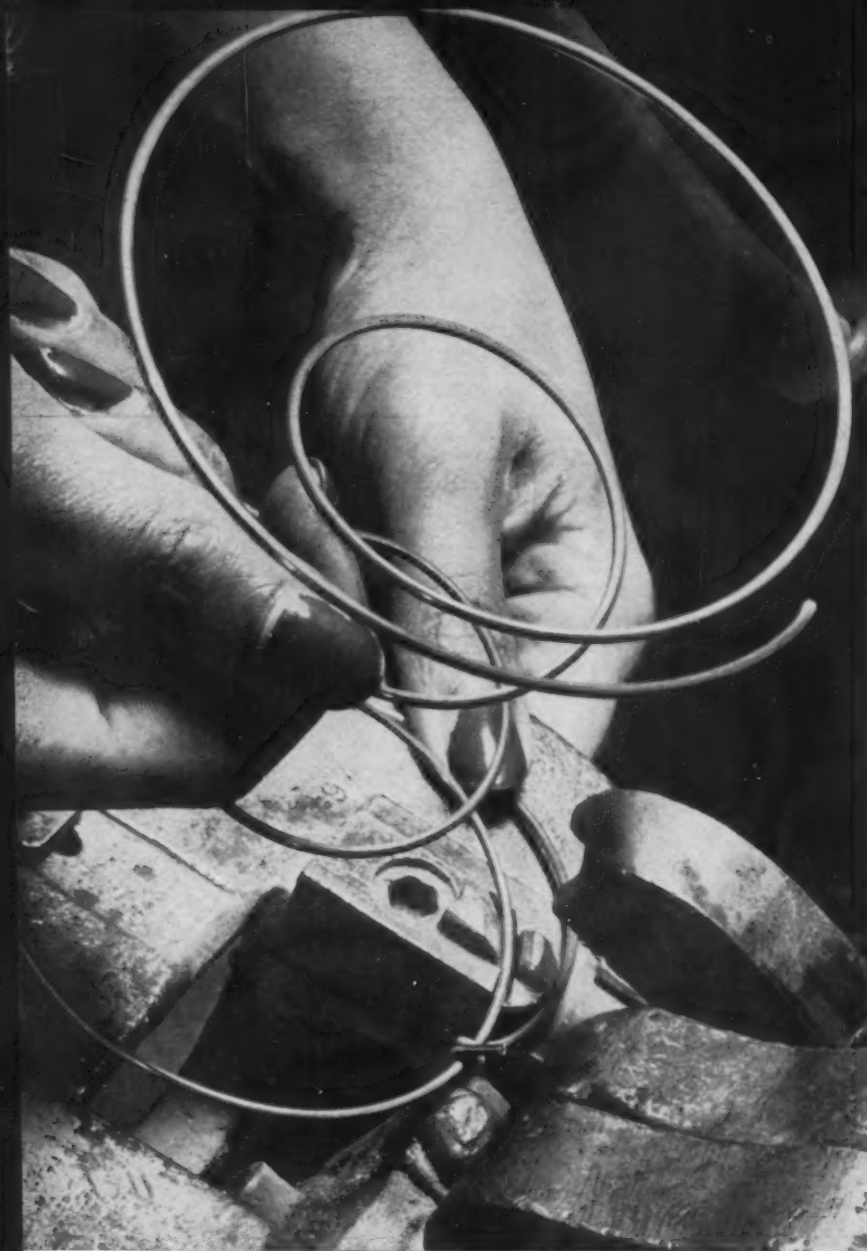


First in steel strapping

SIGNODE STEEL STRAPPING CO.

2623 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto



Tough test for Pittsburgh Steel's upholstery wire at Piedmont Spring Co. comes in coiling and knotting spring. Wire that is too hard will

break; wire too soft will lose springiness even after tempering. Uniform quality of Pittsburgh Steel wire insures uninterrupted production.

Pittsburgh Steel wire adds years of life to upholstery springs

Piedmont Spring Company calls Pittsburgh Steel upholstery wire

"Best we've ever seen"

Pity the poor upholstery spring . . .

It goes through the most torturous stresses and strains just getting made. Then, fully formed and ready for use, all it can look forward to are years and years of supporting tons of jumping, running, standing, sitting or just-lounging human weight.

If that upholstery spring is unappreciated, then consider how underrated its wire can be. You have to be a veteran upholstery springmaker to know what it takes to make a first rate spring that can outlast the furniture it serves.

Such men are Bill and Bob Gaston of Piedmont Spring Company, Hickory, N.C. They choose only superior quality wire—like that supplied by Pittsburgh Steel Company. During their 31 years of combined springmaking experience, the Gaston brothers have seen just about every twist and turn there is to springmaking. Bill Gaston, who handles purchasing, sums up Pittsburgh Steel upholstery grade wire this way:

"Pittsburgh Steel wire is the best we've seen anywhere. And I'd tell that to anyone. It's exactly what a manufacturer needs in this business. We get uniform quality in every shipment."

Combination of quality Pittsburgh Steel high carbon upholstery wire and precision springmaking gives Piedmont upholstery springs enough liveliness and durability to serve several generations of furniture owners.

Liveliness—a must in an upholstery spring—can be seen when the finished spring is compressed. If it springs back to within one-quarter of an inch of its original length, say nine inches in a frame spring, then it has the quality to take years of hard use.

Upholstery wire from Pittsburgh Steel also must be able to withstand severe deformation during coiling and knotting.

Proper grain structure is another must. Too hard—the wire will break, scrapping an entire coil. Too soft—the wire will coil and knot easily—but it will be lifeless even after tempering. Plant Superintendent Bob Gaston cites another all-important requirement:

"The wire we use must have uniform diameter—only .001 variation plus or minus allowed up to .075-inch and .002 variation for .076-inch and larger. If the wire didn't meet our close tolerances, it would seriously damage our coiling machines and stop production. And you know what that does to costs and lost orders. But there's no worry there with Pittsburgh Steel wire."

Piedmont Spring also uses Pittsburgh Steel's border and brace low carbon wire for edgewire frames that hold cushion springs. This wire must be able to withstand crimping and bending and have enough stiffness to support the finished unit. High carbon upholstery grade wire—.047 to .155-inch diameter—is transformed into cushion, back and frame springs. Lacing wire is used to join springs together in cushion and back frames.

Bill Gaston gives much of the credit for his company's enviable spring reputation and low production costs to wire from Pittsburgh Steel. He states flatly:

"We've never had a complaint from a customer because of the quality of the wire. It has never failed to meet our specs."

"And there's another thing I like about Pittsburgh Steel's performance," Bill adds. "That's the service. We keep a low inventory of wire. Many times we run to the bare minimum, but we always get our shipments on time to keep production going."

"When we want to talk to Pittsburgh Steel's district sales office, we get quick attention from the district manager himself right on down."

"Our aim at Piedmont is to make only the best upholstery springs—springs that will take years of hard use without failure. And we get them thanks to the most important ingredient in a spring—quality wire like ours from Pittsburgh Steel."

These same benefits from Pittsburgh Steel's upholstery grade wire can be yours, too. And they don't stop with upholstery wire. Oil tempered wire, bright basic, core wire, ACSR wire, rope wire, high carbon MB spring wire or any other kind of manufacturers' wire are available to serve your needs.

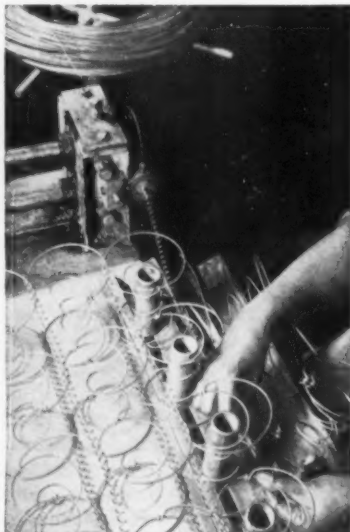
Trained Pittsburgh Steel engineers are close at hand to put their knowledge and experience to work in helping solve your problems.

Specify Pittsburgh Steel wire. Call the nearest district sales office listed at right. Do it today.



"Best wire we've ever seen" comments Bob and Bill Gaston (left and center) about high carbon upholstery grade wire from Pittsburgh Steel. The two owners of

Piedmont Spring Co. check the life in a Piedmont upholstery spring after tempering. After compression, spring must return to within one-quarter of an inch of original length.



Cushion springs are joined together by lacing wire, forming the shape of a cushion frame for an upholstered chair. Piedmont springs made of Pittsburgh Steel wire take years of hard use.



Baling for shipping, Piedmont upholstery springs are compressed to save space. Bill Gaston says, "We've never had a complaint from a customer because of the quality of the wire."

Pittsburgh Steel Company

Grant Building

Pittsburgh 30, Pa.



District Sales Offices

Atlanta
Chicago

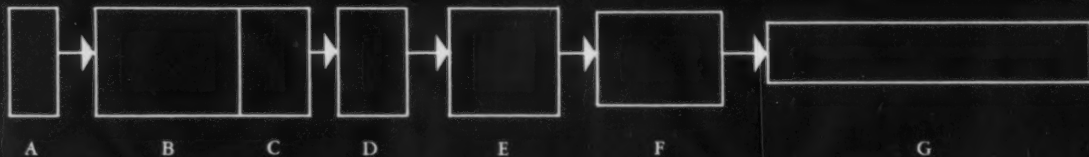
Cleveland
Dallas

Dayton
Detroit
Houston

Los Angeles
New York
Philadelphia

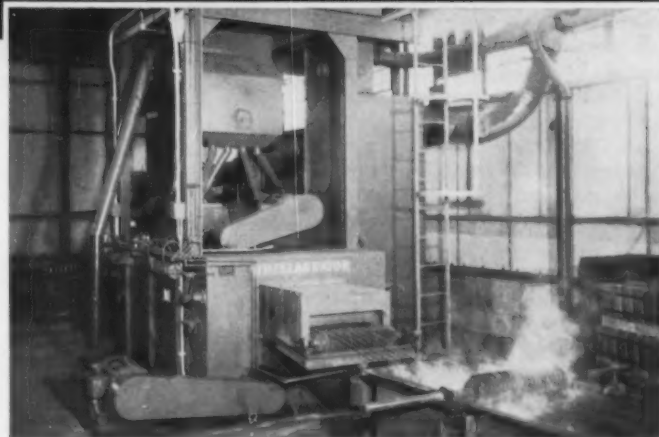
Pittsburgh
Tulsa
Warren, Ohio

FROM HOT ROLLED ROD THROUGH PATENTING, CLEANING AND COATING IN ONE CONTINUOUS OPERATION



THE LESCHEN WIRE ROPE DIV. AUTOMATED STRAIGHT-LINE PRODUCTION METHOD

- | | |
|---------------------------------|---------------------------------------------------|
| A. Twelve-strand Pay-off Reels. | E. Wheelabrator Abrasive Blast Descaling Cabinet. |
| B. Rod Annealing Furnace. | F. Borax Coating and Drying. |
| C. Lead Quench (Patenting). | G. Horizontal Takeup Recoilers. |
| D. Water Quench. | |



Leading producers of wire products are now using Wheelabrator® straight-line abrasive blast descaling as the shortest distance between steel rod and wire profits. At H. K. Porter Company, Inc., Leschen Wire Rope Division, St Louis, for example, this process is resulting in exceptional production efficiency and economy.

The automated processing line starts with hot rolled rod, and in one continuous operation produces cleaned and coated rod for subsequent drawing. Wheelabrator mechanical blast descaling is an essential step in this process. It cleans twelve strands at a time in line with patenting, coating and drying and delivers cleaned and coated rod for multiple hole drawing. There is no interruption

and no intermediate handling required. Furthermore, the line operates continuously five days a week, 24 hours a day without downtime.

All scale or rust is completely removed down to virgin metal, at speeds required for patenting. The fine matte finish obtained holds a more uniform coating and provides excellent drawing characteristics. This blast descaling process offers freedom from the problems associated with acid pickling. And, through automated production, important additional savings in time and labor costs are achieved by reducing "in process" inventories.

It will pay you to consider this new process for cleaning any type of ferrous or non-ferrous hot rolled rod and bar stock for cold drawn products.



WHEELABRATOR

CORPORATION

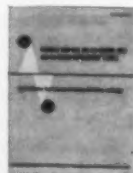
510 South Byrkit Street

Mishawaka, Indiana

Canadian Offices: Scarborough (Toronto) - Montreal

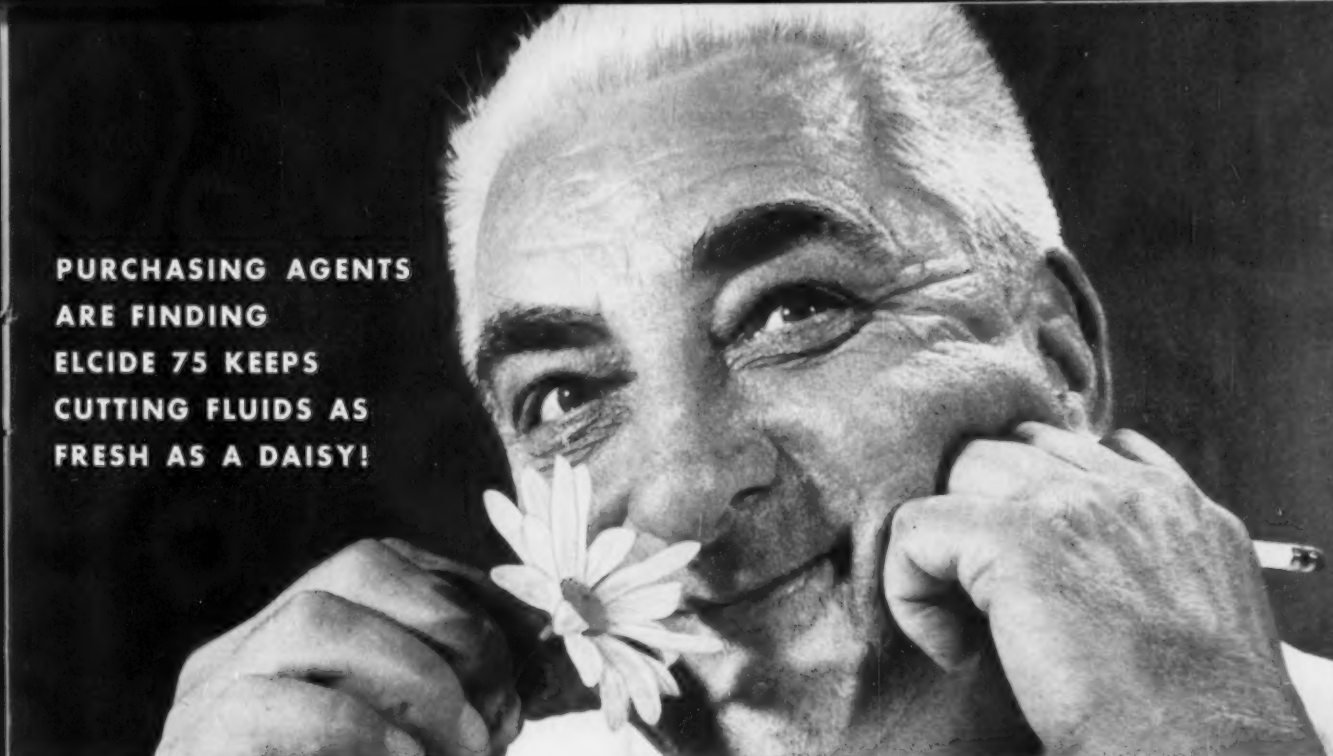
HOW TO AUTOMATE YOUR
WIRE DRAWING LINE

This new booklet explains how Wheelabrator blast descaling can enable automation of your wire production. Write for Bulletin 148-D.



WORLD'S LARGEST MANUFACTURERS OF AIRLESS BLAST CLEANING EQUIPMENT AND STEEL ABRASIVES

**PURCHASING AGENTS
ARE FINDING
ELCIDE 75 KEEPS
CUTTING FLUIDS AS
FRESH AS A DAISY!**



ELCIDE 75™ extends the life of soluble oil emulsions

... lowers operating costs three ways

Less oil concentrate is purchased because standard duty emulsions last far longer when treated with one ounce of Elcide 75 per four gallons of emulsion.

Labor costs are reduced because less non-productive time is spent recharging machinery. The labor costs of disposal also decrease because there is much less waste-oil to be handled.

Production increases because machines are not shut down as often. Elcide 75 also contributes to better products and longer machine tool life by controlling the bacteria that may cause staining and corrosion. Employee efficiency improves, too, because Elcide 75 eliminates odor and controls bacteria that can cause skin infections.

Elcide 75 is more effective than other inhibitors because it is a combination of antibacterial agents, and includes a powerful new compound related to one of the safest, most effective bacterial inhibitors used in medical surgery. This combination controls a wider range of bacteria, including certain types that were resistant to commonly used germicides.

Elcide 75 controls harmful bacteria...

This photomicrograph shows one type of bacteria that enter emulsions through the air, water, and plant debris. They multiply rapidly and cause odor, staining, corrosion, and emulsion breakdown. Their damage costs the metalworking industry thousands of dollars each year.



Elcide 75 specifications: Active Ingredients—Sodium Ethylmercuri Thiosalicylate (Thimerosal) and Sodium o-phenylphenate. Price per gallon—1-gallon polyethylene, \$8.50, 5-gallon polyethylene, \$8.00, 55-gallon stainless steel, \$6.50. Sold only through selected distributors. For more information or to place your order, phone or write:

ELCIDE 75

Lilly

Lilly's brand of bacterial inhibitor for cutting fluids



PRECISE DEPENDABLE, AND CONSISTENT FABRICATING EQUIPMENT IS ESSENTIAL FOR PROFITABLE PRODUCTION

Where do equipment builders hide machines that won't work?

Far too many of them are hidden in customers' plants! And many successful men like yourself, who devise production processes and specify equipment, have gained invaluable experience from such painful, vendor mistakes.

But, regardless of the lesson involved, *your overhead* can't afford the lost production time and heavy expense while you rebuild, or test and prove the vendor's equipment for him. No matter how attractive the original price of the equipment, it's false economy if the price tag didn't itemize the extra money required to make it work right.

Sciaky has always accepted full vendor responsibility for delivering equipment *into production* according to your original specifications. That's why Sciaky resistance welding and production equipment is thoroughly tested and proved to do

your particular job *before shipment*. That's why Sciaky equipment is commonly installed, qualified, and certified to the most rigid welding specifications in a minimum of time after delivery.

Why take less than the full advantage of consulting with a Sciaky Application Engineer the next time you are considering equipment. No obligation, of course.

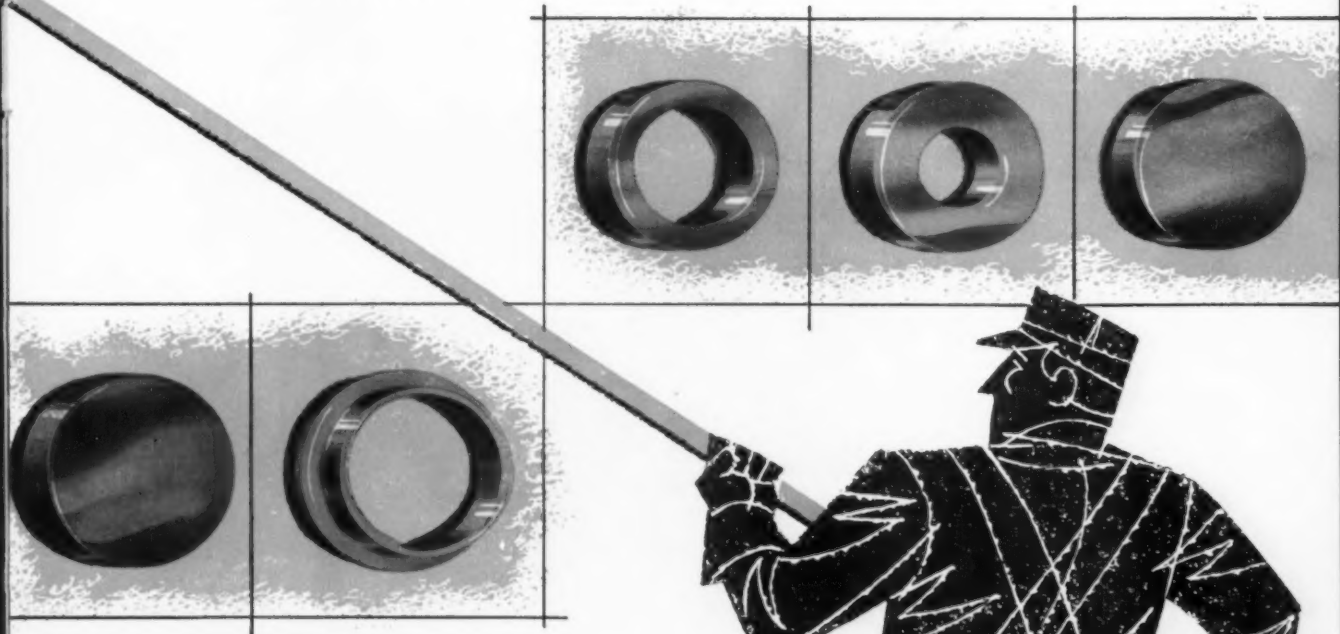
Manufacturers who must satisfy the highest requirements of dependability, consistency, and performance for either research and development or production take that advantage.

Documented case histories of manufacturers who have taken full advantage of Sciaky Techniques of Resistance Welding are presented in the publication "Resistance Welding at Work." Write for copies and advise your field of interest.



SCI AKY BROS., INC., 4923 W. 67th STREET, CHICAGO 38, ILLINOIS • PORTSMOUTH 7-5600

NOW greater economy, improved quality with JOHNSON *Continucast** 105" bronze bars



Now famous Johnson quality solid and tubular bronze bars are being produced by a continuous casting method to give you the economy and convenience of 105" lengths.

CONTINUCAST bars are economical because your distributor will cut this long bar in multiples of a variety of lengths to suit your requirements. You buy and handle less metal—pay for only the metal you use.

The continuous casting method improves the physical qualities of the Johnson alloy 72 (SAE 660). Internal and surface defects are eliminated and the distribution of lead and other elements is more uniform. This improves machinability, makes for longer tool life. You also get greater tensile, yield, impact and fatigue properties.

Johnson CONTINUCAST 105" Bronze Bars are available in 21 sizes of solid bars from $\frac{1}{2}$ " to 3" in diameter, and in 118 sizes of tubular bars which range from $\frac{1}{2}$ " to 2 $\frac{1}{2}$ " ID and from 1" to 3" OD.

To get the benefit of greater economy and quality of CONTINUCAST bars ask your distributor to supply you. For further information write for folder JBL-14.

*Trademark.

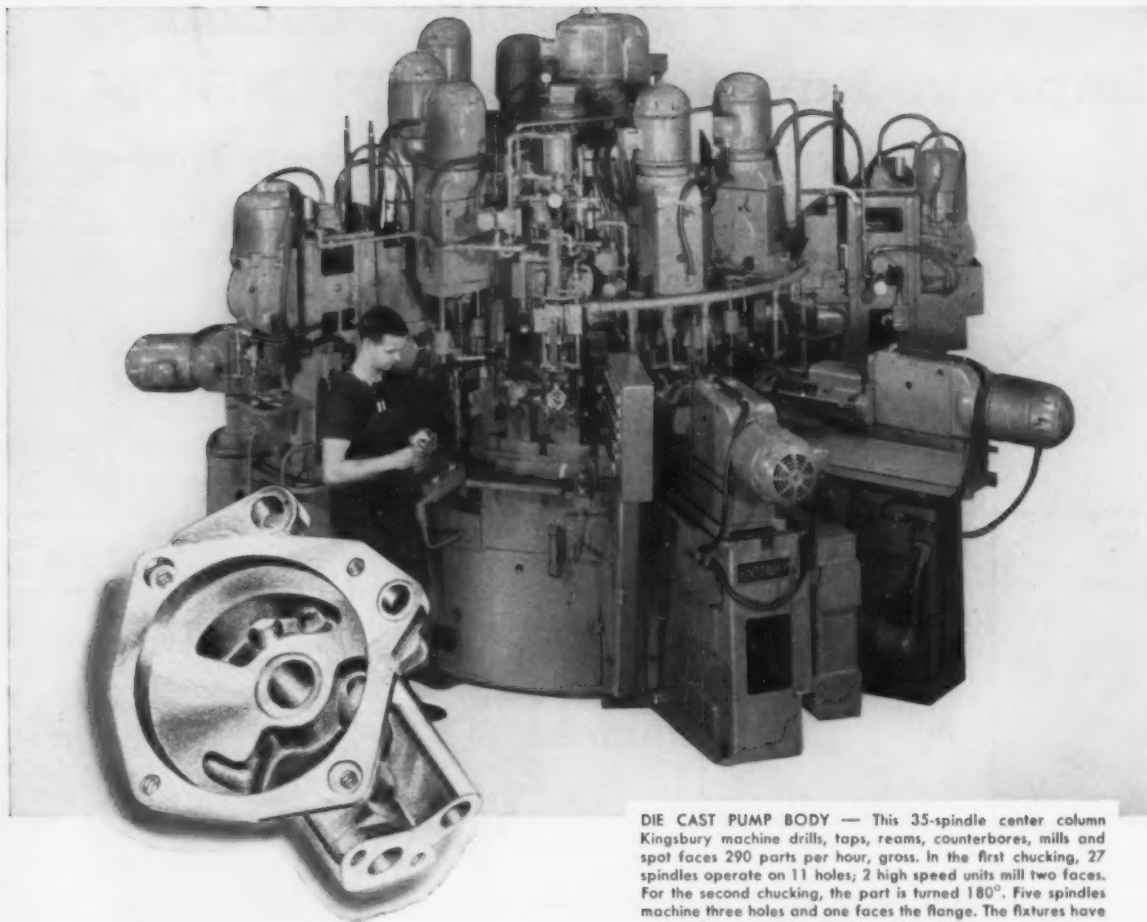
**JOHNSON
Bearings**

Johnson Bronze

505 South Mill Street • New Castle, Pa.

Subsidiary: Apex Bronze Foundry Co., Oakland, Cal.





DIE CAST PUMP BODY — This 35-spindle center column Kingsbury machine drills, taps, reams, counterbores, mills and spot faces 290 parts per hour, gross. In the first chucking, 27 spindles operate on 11 holes; 2 high speed units mill two faces. For the second chucking, the part is turned 180°. Five spindles machine three holes and one faces the flange. The fixtures have power clamping and automatic unclamping.

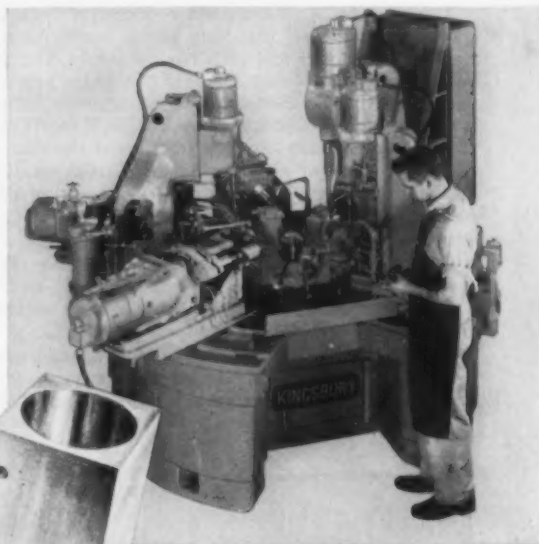
More Good Parts Per Hour

One indexing automatic is complex, the other fairly simple. Both produce good parts month after month at high production rates. The reasons are good basic design, rugged and accurate construction. This is true of every Kingsbury machine. To be sure the parts will meet your specifications, we run test samples for your approval before we ship the machine.

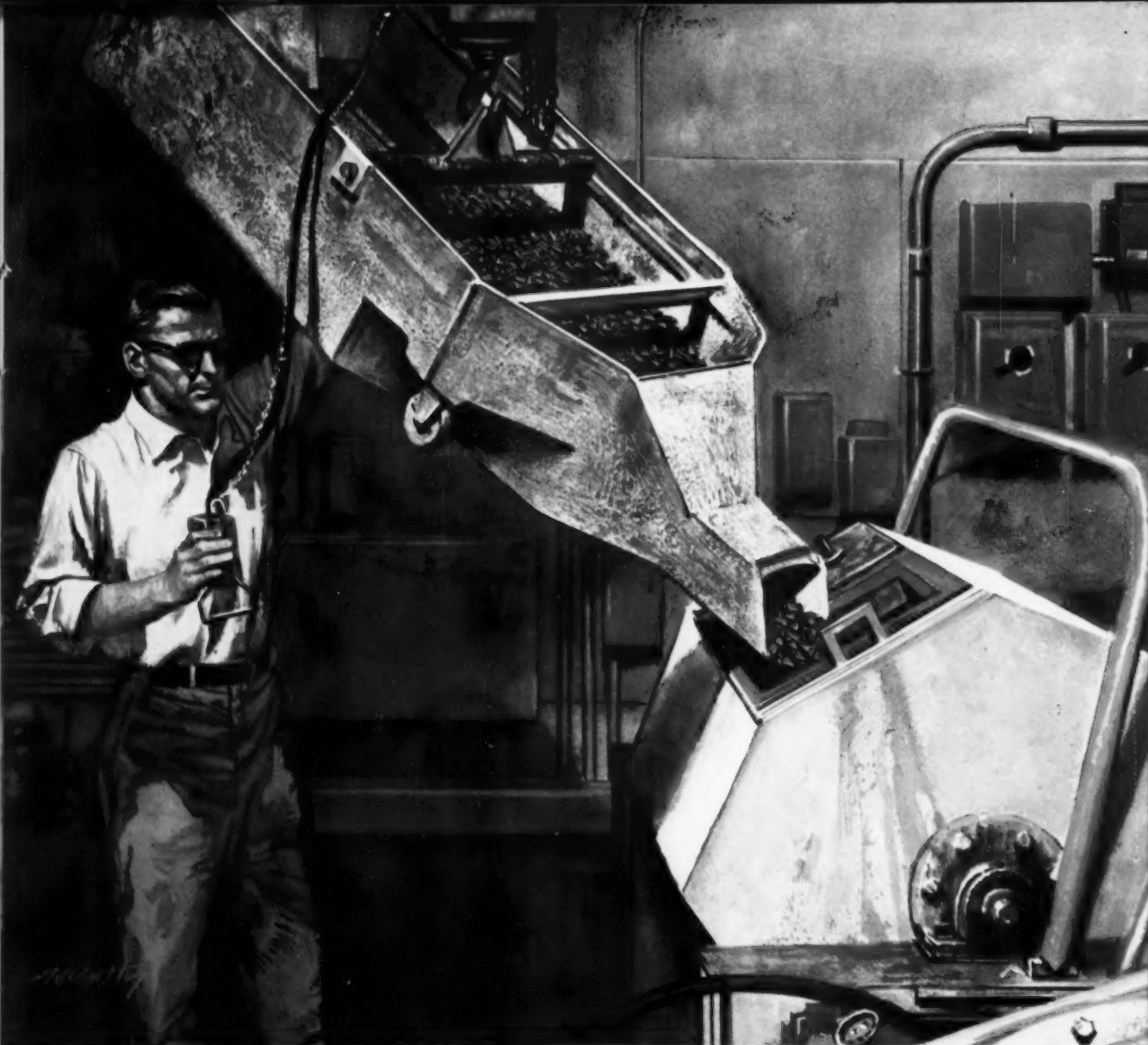
For 38 years, Kingsbury machines have been used for drilling and tapping operations on parts for the automotive, appliance, office machine, farm and industrial equipment and other industries. Let us quote on your jobs. Kingsbury Machine Tool Corporation, Keene, N.H.

KINGSBURY

INDEXING AUTOMATICS for high production drilling and tapping



RADIO PART — This Kingsbury performs nine operations on 560 parts per hour, gross. Three horizontal units with two-spindle auxiliary heads drill, countersink and tap two holes; three vertical units countersink, ream and burnish the axial hole.



The "Touch of Gold" is going into this barrel

... because the operator is adding Norton TUMBLEX abrasive, widely recognized as an unequalled contribution to better, lower cost finishing. For example, after shifting from hand finishing to barrel finishing with ALUNDUM TUMBLEX "T" abrasive, a leading aircraft parts manufacturer

reports yearly savings of over \$90,000. Norton brings this value-adding, profit-increasing "Touch of Gold" to industry in the widest range of grinding, cutting, polishing and tumbling operations... by the most complete line of abrasives... backed by worldwide resources and services.

NORTON COMPANY, General Offices,
Worcester 6, Massachusetts.

NORTON
A B R A S I V E S

Making better products...to make your products better

(Advertisement)

Chemical Prepaint Treatments for Metal Surfaces

What they do, the types available, how they are applied



By J. H. GEYER
Manager, Product
Development Dept.,
AMCHEM
PRODUCTS, INC.

Paint systems have been steadily improved in an effort to produce more decorative, easier-to-apply, and more corrosion-resistant films. The ability, however, of any paint film to perform its predetermined functions cannot be fully utilized without properly preparing the metal surface.

The prepaint preparation of the metal surface is therefore a highly important part of the system. Chemical prepaint treatments are designed to do four jobs and do them well. First, they remove organic soils, shop dirt, scale, and rust or corrosion products from the metal surface. Second, they provide surfaces that are completely compatible with subsequent paint films. Third, they produce a *tooth* that promotes good paint film adhesion. Fourth, they effectively prevent underpaint corrosion growth after any breakthrough in the paint film.

Basically, there are four types of chemical prepaint treatments. These are phosphoric acid, iron phosphate, zinc phosphate, and amorphous phosphate or chromate. Each is discussed briefly in the following paragraphs.



Phosphoric Acid

Perhaps the most widely used and certainly one of the most economical chemical prepaint treatments is the phosphoric acid cleaner combination materials. ACP Deoxidine® is such a material. It removes organic soils, rust, scale and contaminating elements from the metal surface. It also produces a light etch on steel, aluminum or zinc surfaces which considerably aids in increasing paint adhesion. It does not, however, form an actual coating on the metal surface. Any breakthrough in the subsequent paint film will permit

underfilm corrosion to proceed. Grades of Deoxidine are available for application by brush or swab, hot and cold dip, or hot spray.



Iron Phosphate

Iron phosphating processes are extensively used in the chemical prepaint treatment of appliances such as water heater shells, ranges, washers, dryers and other *white lines*. These processes will produce excellent paint-bonding films on the metal and retard or prevent underpaint corrosion. Duridine®, ACP's iron phosphating process, is a combination organic soil cleaner and iron phosphate coating material. Both the cleaning and coating operations take place in the same bath. Duridine and other iron phosphates do not lend themselves to brush-on application, are primarily designed for spray type equipment of four or five stages. But several dip installations are successfully operating today by inclusion of an alkali precleaning stage.



Zinc Phosphate

ACP Granodine® is an example of this type of chemical prepaint treatment process, the type now being used to treat steel in the automotive industry, and predominantly specified for steel ordnance and military items. This process forms a coating which offers the ultimate in paint adhesion promotion and vastly augments the corrosion resistance of subsequent paint films. Zinc phosphate materials are extremely flexible as to method of application—can be applied by brush, dip or automatic spray equipment. In a typical dip or power spray system, the stages would be alkali clean, water rinse, zinc phosphate treatment, water rinse, and acidulated final rinse. If the metal has considerable areas of rust or scale, an acid pickle is advisable following the alkali cleaning stage.

On zinc surfaces, the zinc phosphates perform a rather unique function. They act as a barrier against chemical reaction between the applied paint film and the zinc surface. This effectively prevents blistering of the

paint and early breakdown of the film. This is in addition, of course, to the improvement of paint adhesion and the retarding of underpaint corrosion. ACP Lithoform® is specially designed for use over zinc surfaces and finds wide application as a prepaint treatment for ornamental zinc die castings, refrigerator liners, and on most galvanized work requiring painted finishes.



Amorphous Phosphate and Chromate

These coatings are the films produced by the ACP Alodine processes and similar ones on aluminum surfaces. They have met with wide acceptance in the prepaint treatment of venetian blind strips, refrigerator liners, aluminum heat transfer units, aircraft sheet metal assemblies, and many other items fabricated from aluminum. The various coatings provide an excellent film for the promotion of paint adhesion and effectively prevent underfilm corrosion. As in the case of zinc, aluminum exhibits a tendency to chemically react with some paint systems. The Alodine processes develop a barrier film between the paint and the aluminum surfaces which prevents this reaction. The Alodines are extremely versatile materials that can be applied to aluminum surfaces by brush, hand spray, dipping, mechanical spraying, or roller coating equipment. Brush application is particularly well adapted to the processing of parts too large for simple dip systems or in manufacturing operations that do not warrant a tank setup. In dip, spray or roller coating application, the system usually consists of an alkaline preclean, a water rinse, the Alodine treatment, a water rinse, and an acidulated final rinse. Where the surface is heavily oxidized, a deoxidizer in the line is needed.

The major chemical prepaint treatments for metals have been covered briefly in this article. More complete information can be had by contacting an ACP sales representative or by writing us at Ambler, Pa.

Amchem Products, Inc.
Ambler 20, Pa.



Formerly
AMERICAN CHEMICAL PAINT COMPANY
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Modular Iron and Steel Castings and Weldments.

facts about

LEDLOY*

FREE-MACHINING
STEELS

Considerations in the Use of Inland Ledloy* Steels to Reduce Machining Costs

"Most metalworking plants strive to trim costs as well as metal—so long as quality standards can be maintained. But it takes a lot of ingenuity and 'know how' to neatly balance all three factors: costs, machining efficiency and quality."**

INLAND LEDLOY free-machining steels should be thoroughly investigated in efforts to achieve this end.

You should consider LEDLOY STEELS . . .
. . . if you are presently producing a product from regular carbon steel that requires machining.

The Inland process of adding lead to any grade of steel phenomenally improves machinability without materially affecting other properties. The normally specified physical properties required for a particular application are retained in the equivalent Ledloy Steels. The only characteristic that is affected, and to a marked degree, is the steel's machinability.

Forgings made from Ledloy, for example, can be heat treated and forged in exactly the same manner as similar non-leaded grades of open hearth steels, yet will machine up to 50% faster. A switch to Ledloy for forgings will also result in a superior finish on the machined part.

Whatever grade of steel you are currently using for your products, if machining is an important part of your fabricating process, a change to a similar Ledloy grade can cut your total machining costs appreciably.

You should consider LEDLOY STEELS . . .
. . . if you are presently using a non-leaded machine stock.

Ledloy Grade A, the most widely used leaded steel grade, machines from 25% to 55% faster than regular free-machining steels and yet retains all the desirable characteristics of the non-leaded grade of comparable base analysis.

The precise quality control measures used by Inland in the production of Ledloy Steels result in a surface that is superior to similar non-leaded machining steels. Tolerance control is easier and the completed part has a finer, smoother finish.

You should consider LEDLOY STEELS . . .
. . . if you are presently machining parts from free-machining brass.

Ledloy Grade B, a steel that is somewhat more costly than Grade A, has been used successfully as a sub-

If your product requires machining, it will pay you to get all the details on Inland Ledloy . . . the original leaded steels. Ask your cold-drawer about them today, or write Inland Steel Company, 30 West Monroe Street, Chicago 3, Illinois, for the interesting booklet, "Properties of Inland Ledloy Steels."

stitute for free-machining brass in a number of applications. The basic material cost of Ledloy Grade B is only about half as expensive as brass, yet approaches brass in machinability. However, the higher scrap return on brass, over leaded steels, must be considered in estimating overall cost savings.

If machinability rather than corrosion resistance or non-magnetic properties is the primary reason for the use of brass in a given application, Ledloy Grade B should be seriously considered for its cost-saving advantages. Because leaded steels weigh less than brass, they yield more parts per pound. Then, too, the greater strength of leaded steels often makes possible the redesigning of a machined part to obtain material savings with no loss of strength.

GENERAL CONSIDERATIONS

1. Amount of Machining. Ledloy Steels were developed by Inland to provide a more efficient machining steel. The advantages of their use are in direct proportion to the amount of machining performed on parts made from them. The greater the amount of machining, the greater the possible savings using Inland Ledloy Steels.

2. Capacity of Equipment. If your present equipment is not being run at full speeds or feeds, considerable savings can result by using Ledloy grades and taking advantage of their much greater machining rate. Increased speeds and feeds are possible, and with reduced tool wear.

3. Surface Finish. If finish is important in the machined product, Ledloy Steels can be beneficial. The superior finish resulting from the use of Ledloy Steels has made possible the elimination or reduction of costly additional processing in a number of applications.

4. Tool Life. If the machining operation wears tools excessively, necessitating frequent changes, or if tool cost is relatively high, Ledloy Steels can effect significant savings. Because of its lower friction component, plus the fact that Ledloy provides better chip formation, tool-edge build-up is cut to a minimum when machining Ledloy steels. Ledloy Steels actually lubricate the tool face, reducing heat generated and minimizing tool wear. This means greater production per tool change and decreased costs.

Many grades available—Inland Ledloy free-machining steels are available in a wide range of standard carbon and alloy grades in bar form. Ledloy free-machining plates are also produced.

INLAND STEEL

Sales Offices: Chicago - Milwaukee - St. Paul - Davenport.
St. Louis - Kansas City - Indianapolis - Detroit - New York

INLAND

Ledloy Steels

the world's most
machinable

*Reg. Trade Mark

Boost in Ultrasonic Power

A new magnetostrictive transducer gives twice the usable ultrasonic power for the same electrical input compared to the conventional transducer. The boost in power is due to the spaced arrangement of the laminations which vibrate in unison. The added power extends the usefulness of ultrasonics in metalworking operations, such as electroplating aluminum bus bars with silver.

Coating for Aluminum Engine

A leading die-casting firm is working on an economical method of creating a wear-resistant coat on aluminum die castings. It seems to be quite successful. Various automotive firms are evaluating the new coating in series of tests at their engineering centers. This would overcome one of the last technical barriers to the aluminum engine.

Continuous Cut-Off Method

Researchers have under development a continuous cut-off technique. Patents have been applied for on equipment and method for continuous chipless forming and cut-off of cylindrical metal components. It's expected to be of interest to high-volume producers of items such as needle bearings, rivets and lock pins.

Strength in Pension Funds

Pension funds may tend to moderate union wage demands in the future, says one labor relations expert. He states that the growth in common stock ownership by funds will ultimately give unions a large stake in the profits of industry. He feels also that the same trend may give funds dominant interest in many fields. Other authorities say fund ownership is far from critical stages.

Consult in Value Analysis

January should see the announcement of the first consulting firm specializing in "value analysis." Value analysis is credited with cutting cost of purchased items by thousands of dollars per year for many firms that have tried it. But

it's been heretofore largely performed by company purchasing agents and production men who were forced to learn by doing. It's believed the new consulting firm will do training as well as straight consulting.

Plate Buyers Eye Bookings

Plate buyers will do well to keep an eye on the order books of their steel suppliers. Though plate has been slow and on as little as two-week delivery, some consumers have been warned of a sharp increase over the past week. It may boost lead times to a four-week minimum soon.

High-Temperature Insulator

A new thermal insulation, fibrous potassium titanate, boasts low thermal conductivity up to temperatures of 2200°F. The effectiveness is due to the high refractive index of the fibers which block out infrared radiation by diffuse reflectance. Blocks or mats of varying bulk densities can be prepared from water dispersions. Aside from use as furnace insulation, the material can be used in gaskets, filter mediums, electrical insulation, and many other places.

Experiment with Wheels

Aluminum automobile wheels are being eyed by automakers. Design most often mentioned features a permanent mold cast wheel incorporating hub and brake drum, with bolt-on steel rim. One supplier has already made a number of experimental wheels. Chief stumbling block is to prove that cost is competitive with conventional wheels.

Worry Over Unemployment

Employment specialists of Dept. of Labor are more than a little concerned over lag in employment gains compared with increased production. While a lag is not abnormal in a business recovery, they strongly believe that production will have to exceed the rates of the 1956-57 boom to come up to the employment rate of that period. Even then there were some serious spots of unemployment.

Farval lubrication systems serve 600 points on Australian steel mill

Modern Farval lubrication systems help maintain high-production rates on this 1200 fpm cold reduction mill in the Port Kembla, Australia, facilities of Lysaghts Works, Ltd. They dependably provide around-the-clock lubrication at regular intervals to 260 bearings on this recently installed mill.

Automatic systems serve bearing housing slides and screw-downs every two hours and work roll bearings every half-hour. Manual systems, operated at the start of each shift, require only five minutes' time. Additionally, 340 other lubrication points on metalworking machinery in this plant are served by Farval systems.

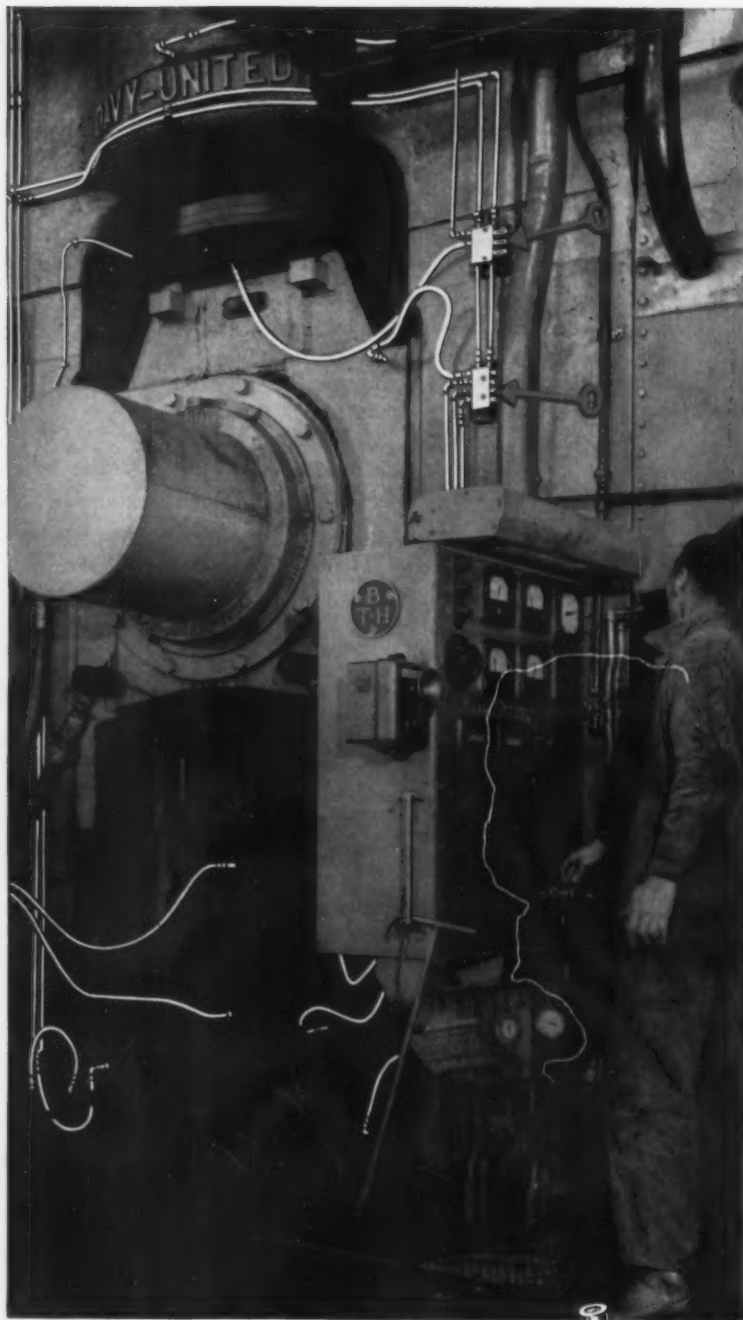
Whatever the country, wherever steel is being made or worked, you're sure to find Farval lubrication systems protecting bearing life of metalworking machines.

To see how correct lubrication can cut labor costs and reduce downtime in your own operations, ask for revised Bulletin 26-S. Write today to The Farval Corporation, 3282 East 80th Street, Cleveland 4, Ohio.

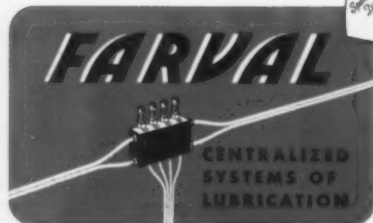
KEYS TO ADEQUATE LUBRICATION

Wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated.

*Affiliate of The Cleveland Worm & Gear Company,
Industrial Worm Gearing. In Canada: Peacock Brothers Limited.*



FARVAL—Studies in Centralized Lubrication No. 223





IN PRODUCTION: Aluminum transmission housings are made at Ford plant using hot metal from Reynolds.

Aluminum Moves Toward Larger Share of Auto Market

Ford-Reynolds "hot metal" arrangement is a straw in the wind.

Guaranteed supply is key to probable growth of aluminum applications in automotive field.

Aluminum engine is in the wings, waiting for its cue.—By R. H. Eshelman.

▪ The picture is coming into sharper focus. After years of nibbling at the fringes, aluminum may be on the brink of realizing a much larger share of the automotive market.

Up to now, production application of aluminum in American

autos, despite its excellent design factors, has lagged because of two things: Lack of components designed to take advantage of its specific properties; second, failure to apply mass production techniques to processing of aluminum in auto plants. Supply of aluminum has been spotty since World War II. Only remedy for the situation: A huge long-term capital investment program.

Ford - Reynolds Arrangement—Meanwhile, opening of the molten aluminum operations to the press at the Ford and Reynolds twin plants at Listerhill, Alabama this week serves to underscore predictions of a shift in metal markets.

As far as the automotive field is concerned changes would certainly be evolutionary, a gradual buildup in applications. Perhaps the aluminum engine.

Significance of this event, however, spreads far beyond the immediate word of increased aluminum in '59 models: 58 lbs on an average, much more for many makes. In recent months leaks from usually well informed sources indicate aluminum engines may not be too far off (The Iron Age, July 3, 1958). Buick in 1958 with its aluminum brake drum apparently triggered a move toward an aluminum wheel. Kelsey-Hayes has developed an experimental hub and drum unit. Many automotive engineers seem

to feel this is the answer to some brake design problems encountered with smaller wheels. A spokesman for the firm recently commented that when design and production problems are ironed out, so that costs are competitive with conventional drums and wheels, designers in the industry will certainly plump for them.

Guarantee Supply—Key to volume use of aluminum in the automotive industry is assurance of a stable, adequate supply. That's where hot metal tie-ins between primary aluminum producers and the manufacturer come in. With the high production requirements of the industry, manufacturers simply couldn't rely on the past few years' unstable aluminum market.

Molten aluminum contracts guarantee that supply. Here's how it works. Ford Motor Company in 1955 foresaw its accelerating need for aluminum. Most of the requirements appeared to be in casting. Secondary aluminum (pig or ingot) obviously couldn't be considered a dependable source, since Ford forecasts called for maximum castings more than 25 pct of total annual supply. Too, the impact of

purchase of such quantities of secondary aluminum would have considerable influence on its price.

Go Together—Locating a casting plant next to an aluminum production plant gives both Ford and Reynolds certain operational advantages. Prime one, of course, is that the aluminum can be transported directly in a molten state from the electrolytic cells or "pots" to the casting plant and poured immediately.

Now the two companies have agreed on a ten-year contract. Beginning operations on transmission housings and smaller parts, the Ford casting plant is planning to use about 64 million pounds of aluminum a year. Present capacity of the Reynolds reduction plant is some 380 million pounds. And this can readily be increased, company spokesman acknowledge. By 1960, capacity is expected to reach 600 million pounds.

Unusual Layout—The plants are located about a quarter-mile apart, about five miles east of Sheffield, Alabama. Operations in the Ford plant are geared to transport molten aluminum. Specially equipped ladle trucks shuttle along a private road

connecting the Reynolds and Ford facilities.

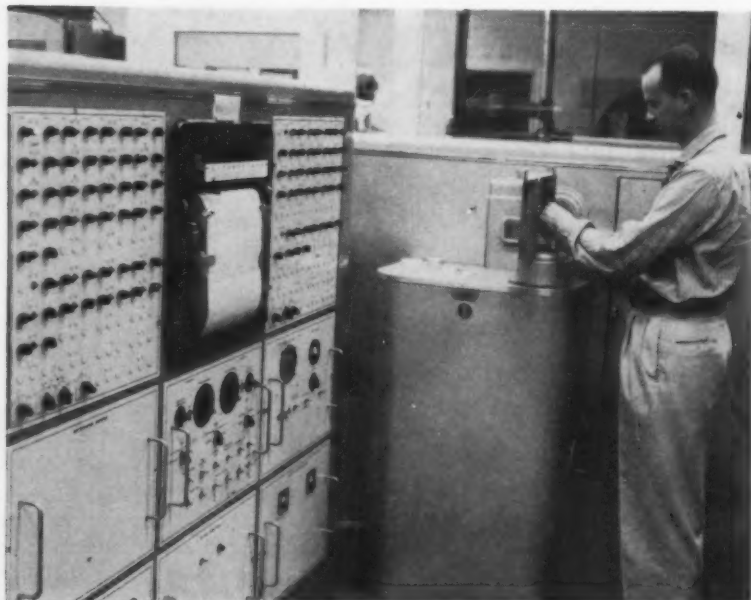
Aluminum is delivered to the hot metal receiving building, which eventually will contain 10 holding furnaces—total capacity 560,000 pounds—to keep the metal in molten form. Additional furnaces melt metal trimmings.

Both Methods—Molten aluminum is carried to casting lines by power driven monorail ladle cars. When in full operation the plant will have five die casting areas and two for permanent mold casting. After casting, parts are trimmed and sent to other Ford facilities for machining and assembly.

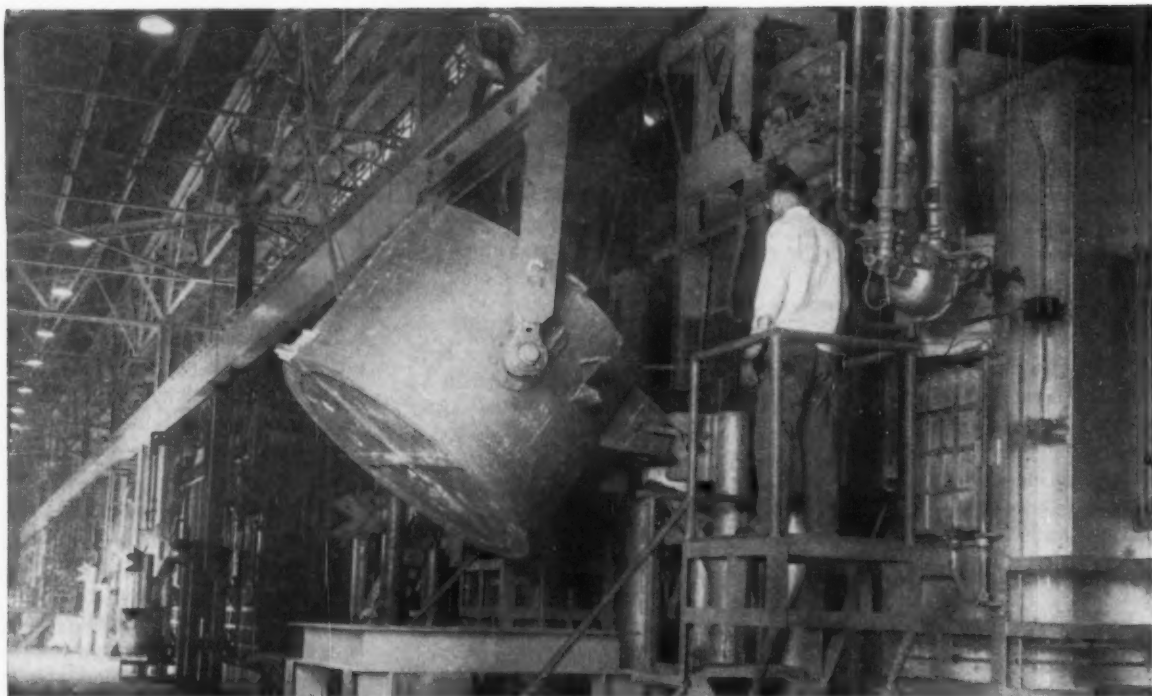
Full production of the plant is about 140 tons of aluminum automatic transmissions and other functional parts a day. These are produced for company engine plants in Cleveland and Lima, Ohio and Dearborn, Mich; automatic transmission plants at Livonia, Mich. and Cincinnati, Ohio; and parts manufacturing in Ypsilanti, Mich. The Ford castings plant employment is expected to peak at 800, with an annual payroll around \$4,000,000. Some \$13,000,000 is budgeted annually for raw materials, supplies and services. Payments for transporting raw materials are at rate of \$600,000 a year.

Other Plants—The hot metal idea originated some time ago, on a suggestion from "Boss" Kettering, it's reported. Pilot plant was the GM Fabricast Div. installation at Jones Mills, Arkansas, whose operations since the beginning in 1950 have been shrouded in secrecy. Press visitors are carefully steered away from the plant on various pretexts.

Meanwhile GM's Chevrolet division is also preparing to go steady with Reynolds. At Massena, New York. Chevy will open an aluminum casting plant next spring. It will be able to handle some 75 million pounds of molten metal a year from the nearby Reynolds facility. The reduction plant, however will have an initial capacity of 200 million pounds. Recently Ed Cole, Chevy General Manager, ex-



ELECTRONIC BRAIN: This Quantometer at Ford plant measures alloy content of molten aluminum as an aid in maintaining quality.



HOLDING FURNACES: Molten aluminum from Reynolds reduction plant is kept in giant furnaces until used.

plained that the St. Lawrence location would cast aluminum pistons. A newsman commented "that's a lot of pistons, Mr. Cole," the implication being that Chevy has other products in mind. It may be a coincidence that there's a Chevrolet engine plant in Tonawanda, N. Y.

Chrysler is also studying the situation, but is not ready to make a move yet, according to best advices. Although it has pioneered in automotive uses of aluminum, executives reportedly feel their transportation and supplier factors do not favor this arrangement at present. Chrysler products, however, have consistently utilized higher-than-industry averages of aluminum. The current models contain some 100 pounds of the metal.

Study Production Design—

There's ample evidence cited that all the automotive firms are well into design and production problems of an all-aluminum engine. "Boss" Kettering commented as long ago as the Spring of 1957: "An aluminum automobile engine may be the next major development

in passenger car power plants."

Technical breakthroughs in die-casting techniques, notably by Doehler-Jarvis, have made mass production of large castings needed for engine blocks practical. While some automotive engineers seem to favor permanent mold casting, indications are that major question remaining is just one of timing.

Importance of the engine application is indicated by the statement by David Reynolds, Executive Vice President, Sales, of Reynolds Aluminum: "When aluminum engines are adopted by the auto industry it can mean that this single application alone will amount to more than a billion pounds of aluminum per year."

Other Proposals—In addition to wheels, brakes, and engines, aluminum company engineers are busy experimentally fabricating other possible applications. One is monocoque-type panels, incorporating both functional and decorative features. Some they've unveiled include hoods and rear decks, also integral bumpers and grilles.

These are still just proposals. Automotive people indicate that any design changes must win their own way strictly on merit—and cost. The feeling seems to be growing in Detroit circles, however, that the answer to present criticism of American cars may prove to be a light car rather than a small car. That would afford competition with European models on operating economy while retaining American comfort features.

Financial Hitch-hike—Testimony by the aluminum industry before the Yates committee indicates the general importance of the molten metal arrangement: "The contract with Ford (Listerhill) in 1955 was made at a time when shortage of aluminum was being felt severely by all the industry."

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Deliveries Haunt Steel Buyers

Some purchasers are getting caught between rising steel needs and lengthening mill shipments.

Even for products in good supply there's more evidence of advance buying.

■ Steel buyers are trying not to let the market get away from them. But it's getting increasingly difficult.

Caught between increased production needs for steel and lengthening deliveries, they face mounting problems.

One automotive steel buyer, for example, is prodding his mills about cold-rolled sheet deliveries. He's received three advances in November production schedules within the last 45 days. So far he's booked enough sheet to fill them. But since his steel

mill suppliers are a week behind in deliveries, he'll get 25 pct less steel than he needs. And any further requests for steel will send him looking for other sources of supply.

Spreading Out—While still concentrated in products like sheet, coated sheet, and bar, the delivery concern is spreading. "We know structurals are in good supply," says a Midwest fabricator, "but demand elsewhere is stretching deliveries. So we're increasing our buying."

A stainless steel buyer comments: "Maybe the market's still lagging, but we're starting to book tonnages a month or more in advance." Even plate buyers are looking ahead. In Eastern markets, where heavy plate is available in two weeks, an electrical equipment maker has booked tonnages through March, 1959.

Why Demand Grows — "Buyers are definitely edgy," says one mill sales manager. "Hardly a day goes by without purchasers asking if deliveries can't be advanced, or tonnages increased."

It's clear the upturn in manufacturing activity is the prime factor in the developing delivery pinch. Take the case of the Midwestern steel buyer for a packaging equipment concern.

He got word two weeks ago that November production schedules would be advanced 10 pct. At the moment he has less than a normal (30-day) in-plant inventory on hand. His cold-rolled sheet orders are a week to 10 days behind schedule. And it's no longer possible to book November sheet in his area. Some mills are even sold out on cold-rolled sheet into January.

How P.A.'s Feel About Their Steel Stocks:

Appliance Maker: "Our present stocks will be o.k. if the sales department doesn't decide we can sell more refrigerators in December. They've done that twice already, and if they do it again, I'm going to be in trouble."

Building Materials Supplier: "This is supposed to be the start of our slack period, but we're still on two shifts. We planned to build up a normal 60-day steel inventory during July and August. But even in August our stocks were at a record low."

Electrical Machinery Maker: "Normally we order about two months ahead. But now we're already thinking first quarter. We've placed plate tonnages with mills all the way through to March. Partly it's concern about a tightening market, partly interest in building stocks before a possible steel strike."

Equipment Manufacturer: "I'm worried about increasing delivery times. So far we're doing all right, but lead times have a way of jumping out every 24 hours. Even if I check my mill suppliers at noon one day, I'm back on the phone the next morning."

Steel Service Center: "We're trying to bring up our inventory, but at the moment we're only able to hold it even. Our mill purchases for November on some products are up 15 pct. Frankly, the auto labor troubles gave us a little breather this month. If things had gone at the pace they did when the month began, we'd have run dangerously low on steel stocks."

Auto Parts Supplier: "We're in trouble facing a possible shutdown in November. Our inventory is below a 30-day level and we're working on 2-4 weeks' lead time in getting steel deliveries."

Help from Buyer—One stampings firm, also in the Midwest, got aid from a customer when caught short in filling an order.

Because the stamper's steel supplier was behind on deliveries the buyer himself provided the 100 tons needed to process his order.

Even at that the customer had to locate the tonnage at a steel service center. No mill could fill the order quick enough.

Cause for Concern—Threatening a further tightening in sheet demand is the prospect of increased buying from Detroit automakers. Even while auto labor troubles have deferred sheet orders, many mills in the Midwest remain delinquent on deliveries to other buyers.

These added points will influence sheet deliveries: (1) Steel service center stocks of hot- and cold-rolled sheet are not strong. One chain says its cold-rolled stocks are at their lowest level of the year. (2) Tinplate and galvanized sheet mills, which use cold-rolled sheet as base product, are operating at high levels. (3) Some sheet buyers hope to build inventories against possible price increases or strike-shortened supplies next year.

Galloping Galvanized—Purchasers of galvanized sheet are buying at a frantic pace. As a result many mills are sold out through most of December. Shipments have run ahead of last year's levels in every month since May. For the last three months they were reported better than the best month in 1957.

August shipments were 253,000 tons. This was roughly 30 pct better than August 1957.

Behind this rise is first of all a booming farm year. Grain production is up sharply from 1957. Galvanized grain bins have been a big help. Miscellaneous farm applications have also played a part in the gain.

Construction products and straight construction uses have accounted for most of the rest. The gain in housing has put more galvanized into air conditioners and heating systems.

How Purchasers Measure Their Performance

Formulas for checking purchasing efficiency were exchanged at P.A.'s workshop.

One weighs relative importance of items in terms of total purchases.

■ How can you measure the success of a purchasing department? Here are some suggestions that emerged from the Purchasing Agents' Workshop recently conducted at Illinois Institute of Technology:

Allis-Chalmers Mfg. Co. has developed a weighted formula showing the relative importance of each item bought, as a percentage of total purchasing costs. Using the formula, purchasing can then multiply a new price increase times the weighting factor, to show sales and manufacturing how a price increase will affect total materials costs. The formula has aided in forecasting cost increases, for budget purposes, as far in advance as 12 months.

Another version of this formula: Figuring an index of purchasing department savings (dollars saved by purchasing divided into total dollar value of purchases) compared with increases in market price of materials.

One objective measure that's meeting increased acceptance is figuring cost of purchasing as a percentage of total purchases made. It's been pointed out that the cost of a single purchase order may vary from \$3-\$10. The figure is a little too wide spread to be of concrete help.

In a recent study, it was found that 8 electrical companies reported purchasing department

costs averaged .96 pct of total purchases made. The low figure on this spread was .25 and the high was 1.15 pct. In 18 fabricated metal plants purchasing department costs as a percentage of total purchases ranged from a high of 1.33 pct to a low of .36 pct. The average was .66 pct.

Other industry averages—metal furniture and fixtures, .28 pct; instruments and electronics, 1.30 pct; machinery, .79 pct; primary iron and steel (three companies reporting), .36 pct.

Purchasing department costs for the entire durable goods producing group averaged .81 pct of total purchases.

Among the well-known firms mentioned at the Workshop, Ford Motor Co. spends about \$4 billion at a purchasing department cost of 0.4 pct.

More companies are getting interested in inventory control meetings. One purchasing department conducts these regularly with sales, production, and financial representatives sitting in. The P. A. reports on material availability and price trends and then inventory needs are calculated.

One firm is supplying the purchasing department with "critical item" lists, so buyers can concentrate their efforts on most needed products.

Another purchasing department idea that has met with real success: Purchasing in one large metalworking plant distributes a "procurement time book" to other departments. Idea is to keep inventory down, while still allowing a safety margin in case sales suddenly decide they need more production.

A New Labor Relations Climate?

Experts Say It Must Come, or Bargaining Is Doomed

If negotiating table strategy continues along present lines, there's trouble ahead.

Inflation spiral may bring on government control of prices and wages.

▪ Collective bargaining may be headed for drastic change in the near future.

In Pittsburgh, top labor and management men warn that unless collective bargaining can be made to work better, we may be in for government control of wages and prices. The danger signs: Mounting public pressure for a halt to inflation, and growing competition from low-cost foreign producers.

Best System Ever — Veteran negotiators are calling for new attitudes by both companies and unions. They want high level conferences to develop better relations. They recommend developing new techniques to peg costs and wages.

"We're tossing away the best system ever devised," says Leland Hazard, vice president and general counsel, Pittsburgh Plate Glass Co. Mr. Hazard feels management has a new responsibility in its labor negotiations—that it must weigh the effects of any agreement on prices and living costs.

Management's Burden—Mr. Hazard feels that both labor and management must consider the inflation problem, but that the big push must come from management. Companies must resist inflationary demands, he advises, even if it means going through a strike.

John Roche, president, Heppenstall Co., calls for recognition of the problem of small fabricators who are forced to accept the wage

pattern of basic steel. He calls for contracts that take into consideration differences in operation and size.

Imports Hurt—He concedes there might be some plants that are basically uneconomical but, he comments, "don't sacrifice the small plant unless you are sure it's hopeless."

Mr. Roche warns labor that com-

panies might be forced to transfer operations to foreign subsidiaries in order to survive. He cited the case of industrial knives, where his own company was competing against imports that delivered for 35 pct under the domestic price.

Accounting Improved—On the mechanics of setting wages, Mr. Roche recommends that labor think more in terms of company

Long Term Trends in Labor Laws

Massachusetts Institute of Technology Professor Douglas V. Brown, who helped write the Kennedy-Ives Bill, sees these long-term trends in labor legislation:

Union Funds—More information will be required, tighter regulations imposed.

Union Internal Affairs—More regulations will be applied to union elections, trusteeships.

Civil Rights—Little Federal action likely.

Closed Shop—Regulations will be relaxed rather than tightened. Hiring hall arrangements will be legalized. State right-to-work laws may be outlawed by the Federal government.

Union Monopoly—Unions will remain immune to anti-trust action. The right of concerted action by companies in resisting large unions may be more clearly established.

Strikes—The right of unions to strike may be matched by more clearly established right of companies to lockout.

Taft-Hartley—Few changes seen. Provisions on secondary boycotts, strike votes, and hiring halls may be modified.

Emergency Powers—No extension or clarification.

Federal vs State Control—Trend toward extension of Federal power.

earnings rather than a share of the sales dollar. Because of progress in the field of cost accounting, companies are in a far better position to make fair wage offers today than 10 years ago, he says.

Clinton Golden, former vice president of the United Steelworkers, calls for both unions and companies to accept the need for change. To develop closer cooperation between labor and management, he urges that joint cost studies be undertaken. Mr. Golden recommends also that unions shift their bargaining emphasis from wages to total labor costs.

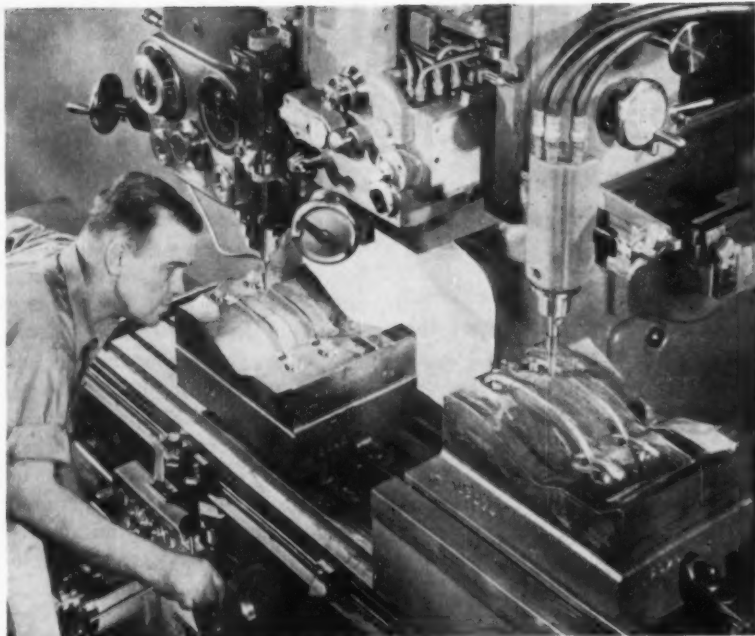
Worker Spirit Important—Successful pay systems based on actual productivity and on profits have been accomplished in a few instances, says Mr. Golden. But such a system can work only when the worker is made to understand the relation of his effort to his earnings.

The difficulty, he adds, is that the cooperative spirit needed to develop this understanding seems to come only when a company is in desperate shape.

Year of Opportunity—An improved climate for bargaining in 1959 is foreseen by Jules Bachman, New York University economics professor, who addressed the industrial relations council of the Associated Industries of Cleveland last week. The improvement will come from business recovering instead of receding, profits rising and output per man-hour on the way up.

Wages and price patterns will be on the increase although it is possible the consumer price index will show only unimportant changes says Mr. Bachman. The opportunity to limit wage inflation will come from rising output per man-hour combined with smaller increases in total labor costs.

While the warnings are being shouted, there appears to be little doubt that union contracts will cost industry more money next year. Mr. Bachman's prediction: A 7 to 10 cents per hour wage package plus some non-wage benefits.



AUTO DIE ORDERS: More business would speed settlement between independent tool and die shops in Detroit and disgruntled workers.

Skilled Labor Balks

■ Skilled workers allied with the auto industry continue to voice disapproval over contract offers.

Threat of a strike was brought into play last week as talks faltered in new contract negotiations between the Automotive Tool & Die Association, representing 79 Detroit job shops, and UAW Locals 155 and 157, representing some 8000 or more skilled workers.

Strike Date Set—Union negotiators accused the trade group of insisting on the right to force employees to work overtime while seniority employees were laid off. They also said the tool and die shops made a "substandard" economic offer, inferior to recent Big Three settlements. They set Nov. 2 as the date for a strike vote.

Tool and die association representatives call the strike threat a bargaining maneuver. Any strike authorization would have to be approved by the International UAW

—a step which would take 10 to 30 days, so a showdown isn't imminent, ATDA believes.

Jobs at Stake—The association insists job shops must have the right to schedule week-end overtime on rush jobs, without recalling laid-off workers, or face the loss of jobs. It has indicated it will hold out for this provision. An estimated 50 pct of skilled workers in Detroit's tool and die shops are now laid-off.

In Tough Mood—The association claims it is already paying 53¢ an hour more than the automakers to its skilled workers. It is attempting to lower this spread, thus hoping to halt the auto industry trend toward doing more of its own work.

Faced with the prospect of holding down costs or going out of business, Detroit tool and die shops are in a mood to be tough. The only thing which will cause them to melt is a large booking of new orders.

Copper Foil Sees Bright Future

Big Boost Will Come From Its Current Markets

Makers of copper foil say things are finally going their way.

They're moving ahead of the competition in their No. 1 market, and have none in No. 2.
—By F. J. Starin.

▪ A short time ago a grain elevator explosion tore the facing off a nearby building. When the builder and the architect started putting on a new shell they found the plastic flashing installed less than a year previous shriveled up and almost disintegrated.

A copper foil man told this story with relish. He concedes this plastics failure doesn't write it out of the flashing, weatherproofing, and dampproofing markets. But it does mark the resurgence of copper foil in its most important market. Plastics had been taking over on price.

Little Competition — In copper foil's other big market there is little competition. It's printed circuitry. This has come from almost scratch in the last 10 years, to now account for about one-third of all copper foil sales.

Copper foil makers are now looking ahead with optimism. They figure they hold all the aces in their No. 1 and 2 markets. Printed circuits offer several key advantages over wiring. They are faster to make, and sharply cut labor costs. Some wiring people have been fighting back on the grounds that printed circuits are difficult and costly to repair. Printed circuit makers say the number of failures is cut so much that they can be replaced at a total cost of less than repairing broken wired circuits.

Complications Help—The growth of more complicated electric and electronic devices is emphasizing printed circuit economies and spur-

ring its growth. Missiles and computers are switching almost entirely. Even household devices are going this way as makers strive for more automatic and smaller appliances.

The flashing market is tied closely to construction. Foil men point out that babies born during the baby boom around World War II will be grown, married and on the market for new homes in a few years. They expect to supply the flashing for most of them.

New Markets — Foil men are spending some time seeking new markets. One that shows promise is electrostatic shielding. A room housing machinery with open arcs is lined with copper foil to prevent them from interfering with radio and TV reception.

A variation of the printed circuit techniques is used to make fine, close tolerance filters. Industry is experimenting with laminated copper foil shingles. And there are rumors that foil people have solved several problems, are almost ready to boost a laminated foil for decorative uses.

Little Export—The copper foil makers have looked overseas. But most of the printed circuits for European companies are made by their subsidiaries in the U. S.

Copper foil was born during the depression, at Anaconda Co. They had the market pretty much to themselves until a couple of years ago when another firm came into the field. A third will be in soon.

Capacity is directly dependent on production of electrolytic copper. A polished lead-plated drum revolves into worn electrolyte from the refinery. Copper is deposited on the drum. If it weren't for the electro-deposited foil process the copper in the electrolyte would not be recovered.



MAJOR MARKET: Printed circuits are outdistancing conventional wiring as electronic devices become more complicated. It's a major market for copper foil that is expected to mushroom even more.

New System Would Simplify Fastener Buying

Under existing schedules a buyer figures the price of a square head bolt with hex nut like this:

1. Select proper quantity discount for bolt with square nut from discount table. Apply to list price, selected from catalogue.

2. Select quantity discount for square nut from table. Apply to list price for nut.

3. Subtract net price determined

for nut from net price for bolt and nut to get the price of the bolt alone.

4. Select proper discount for hex nut. Apply to list price.

5. Combine net prices of hex nut and bolt.

Proposed system

Using a system of net pricing with added breakdowns, the buyer would work this way:

1. Select net price of bolt di-

rectly from price list.

2. Select net price of hex nut.

3. Combine the two.

This system, proposed by Pittsburgh Screw & Bolt Corp., has gotten a highly favorable response from customers. The company has not indicated when it will install new schedules but feels price reforms are inevitable.

Fastener Price Reform Proposed

At least one major producer is planning to revamp its entire pricing setup.

The present confusion was brought to a head by recent price cuts.—By G. J. McManus.

■ Two price reductions in the past two months came as mixed blessings to buyers of fasteners.

The combined slash was sizable. Prices of some fastener products are now as much as 17 pct under the levels of July 1957. But with this relief has come the task of wading through new sets of complicated pricing schedules.

Taking Action—The newest list added a 40,000 lb discount class to the existing four. It added size groupings. It introduced a few more inconsistencies to a structure that was already untidy. It led some purchasing men to throw up their hands.

One fastener maker moved recently to simplify pricing. Pittsburgh Screw & Bolt Corp. has proposed to its customers that (1) Specific net prices be listed instead of discounts; (2) Size brackets be reduced or eliminated.

Freight and Discounts — The company would also like to get away from the confusion of freight equalization by establishing uniform delivered prices on truckload and carload orders. It proposed that the cash discount on miscellaneous bolts be raised to 2 pct, same as the discount on machine carriage and lag bolts.

As it stands now fasteners are priced on a discount basis. The buyer works with discount sheets and list price catalogues. This method simplifies the mechanics of price changing. The manufacturer merely issues new discount sheets.

Buyer Must Work — However, the present system has the disadvantage of requiring calculations by the buyer and seller on every order. The buyer must select the proper quantity discount. He must apply this to the list price. If non-standard combinations are involved, he must juggle multiple discounts.

Much of this effort could be eliminated through the use of specific net prices, according to President Don Greenshields of Pittsburgh Screw and Bolt. Under the proposed system a buyer could read the actual price for his particular quantity directly from a list.

Two Are Enough—Mr. Greenshields feels the whole pricing structure for fasteners needs overhauling. On the question of size brackets, he says the eight or nine classes now provided for machine bolts could be reduced to two or three.

Price tables have not kept up with changing standards, he feels. Recent standards have made machine bolts and cap screws identical in the solid die ranges. If a company is not aware of this it can pay a higher price for a bolt simply by using the wrong terminology.

No Credit Controls

Renewed threats of Government control over consumer credit are diagnosed in Washington as part of a pressure campaign to persuade businessmen and bankers to help keep the lid on inflation.

There appears to be little chance the country will return to the World War II type of regulation, which set minimum down payments and maximum repayment periods on consumer installment credit.

The threat of consumer controls has been used off and on over the past six years.

Westinghouse Puts Science on Parade

▪ Westinghouse Electric Corp. last week took the wraps off enough research laboratory discoveries to start a television series on "Adventures in Science."

During an open house at its Central Research Laboratories near Pittsburgh, Westinghouse scientists:

(1) **Unveiled** an electric motor that will operate while glowing red hot. It has run more than 100 hours while sealed inside an oven at 950°F, has performed useful work at 1200°F. The secret is in a new inorganic insulation that can withstand higher temperatures than can organic materials. It has potential applications where electrical equipment must operate at high temperatures such as in missiles and rockets.

(2) **Discussed** a method of shaking the daylight out of atoms so as to get a better understanding of

complicated matter. The "shaking" is done with sound waves that vibrate up to 20 million times per second. In the process, the atoms' magnetic balance is thrown out of kilter, and scientists say this enables them to get a "look" inside the atoms. Westinghouse says the technique enables its researchers to study the structure of crystalline matter for the first time.

(3) **Demonstrated** high-frequency sound waves that may one day be used to do the family laundry, without soap. But of even greater importance is the industrial potential. Westinghouse said it has used the equipment to electroplate aluminum bus bars with silver, clean printed circuitry boards, and decontaminate pieces of nuclear apparatus. The key development is a new and improved ultrasonic transducer, which changes electrical energy into mechanical sound vibrations. The



HOT WORK: Despite intense heat from jets of burning gas, this experimental Westinghouse Electric Corp. motor still operates well enough to do this grinding job. Special insulation makes it possible.

company said its transducer "is twice as efficient and considerably more compact than any existing units of comparable power."

Westinghouse also unveiled its "Helisphere," a new-type antenna which may be the forerunner of antennas for powerful, long-range, antimissile radars of the future.

More Allowances On Military Contracts

Military buying officers will soon be operating under a new set of "liberalized" (that's what the Pentagon calls them, but some contractors do not agree) rules. Industry will be permitted to charge off more advertising and other such costs that are not now allowed.

The move is likely to draw fire from some Congressional sources, particularly a House Armed Services Subcommittee. This group put pressure on the Pentagon two years ago which resulted in the stringent rules which now govern "allowable" costs.

Soon—Sources at the Pentagon say the new rules will be issued in about a week. Manufacturers will have another two weeks to comment on them.

No Warranty Credit

Manufacturers have to pay excise taxes on the full sales price of their products, the U. S. Supreme Court rules. No deduction will be allowed for the cost of fulfilling customary warranties.

The high court, in two decisions involving the Ford Motor Co., and General Motors Corp., upheld lower court decisions which will require producers of autos, home appliances, and other mechanical or electronic products to pay the manufacturers excise tax on the full sales price.

The Cases—The Ford case involves a request for a \$8.9 million tax refund because the company warranty on its new cars, when repair work is required, constitutes a discount from the original price.

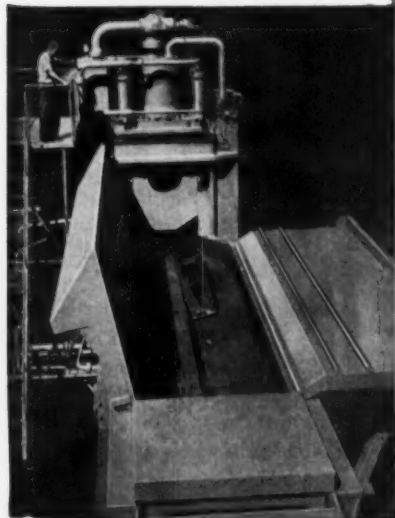
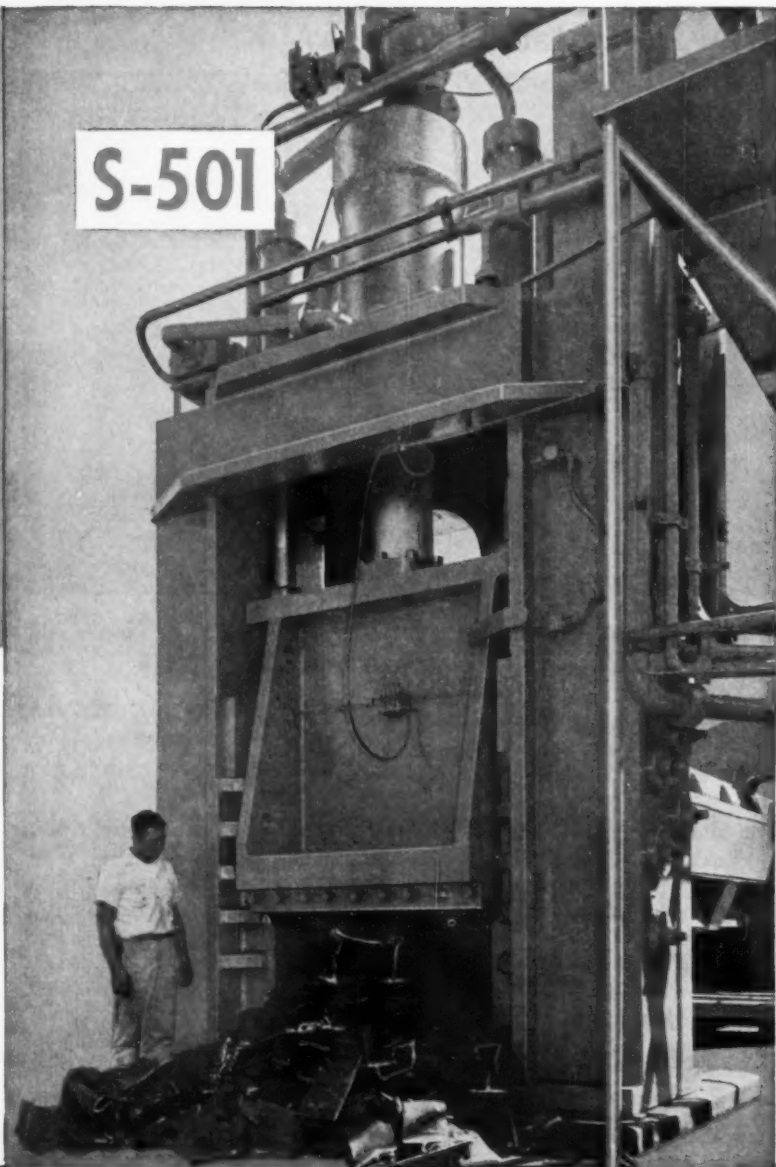
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200 TONS
PLATE
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IN EIGHT
HOURS

production
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labor costs
70% lower

The Harris Shear is revolutionary in design. It is the first new development in the scrap industry since the introduction of the Baling Press. Railroad scrap, pipe, farm, industrial, automobile and miscellaneous junk shop scrap work through on a 12 second cycle. A 3 man crew and a crane handle the job in all kinds of weather.

S-501



The Harris Shear brings new profits to Scrap Yards

The charging box is 264" x 80" x 30". It has a flat type loading hopper. The cover and charging ram operate like a baler. This means more material under each stroke of the knife.

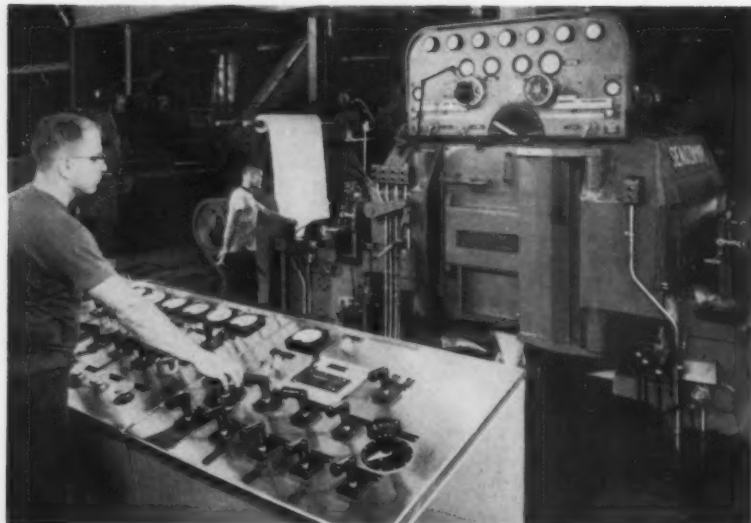
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CORDELE, GEORGIA

► *Talk with a Man from Harris*

New J&L Stainless Steel Mill



■ A \$17 million renovation of the old Superior Sheet Steel Co. at Louisville, O., near Canton, has turned it into a high quality stainless sheet mill, for the new owner, Jones and Laughlin Steel Corp.

With a new 52 in. crown-adjusting Sendzimir it will turn out 36,000 tons per year of polished and drawing quality stainless in 3/16 in. to 0.003 in. thicknesses from hot

bands from J & L's Detroit mill, formerly Rotary Electric.

Fast Work—The plant was converted from a warehouse and stamping operation in less than a year by J & L.

"This new step will give J & L access to over 80 pct of the stainless steel market," says M. K. Schnurr, division president.

Allen Moves Into New Bloomfield Plant

The Allen Manufacturing Co. is now making its hex socket screws and related products in a new plant at Bloomfield, Conn.

The 250,000 sq ft factory has been laid out to promote direct flow operations. Bar and rod stock move from storage racks, are made into finished products, heat treated, packed and shipped around the perimeter of the factory. The central area is reserved for service functions such as testing, maintenance and parts storage.

Pilot Plant—The plant also has a 10,000 sq ft pilot plant for testing new machines, materials and manufacturing processes.

Allen's new raw material handling and storage system is aimed

at getting maximum use of space, efficient selectivity with minimum manpower. Bundles of bar and rod stock up to 12 ft long, weighing to 6000 lb are stacked by a one-man crane on a network of "Christmas tree" racks. Capacity is 4.6 million lb of rods and bars.

New Tungsten Carbide

Carmet Div., Allegheny Ludlum Steel Corp., is ready to market a new, ultra-hard, steel cutting tungsten carbide grade.

Called CA-604, the development has been field tested for more than a year. It operates in the fast cutting ceramic area, and is available only in Indexable blanks.

New Satellite Stabilizer

A General Electric Co. engineer has received a patent for a new

system of preventing a vehicle from rolling over as it moves through space. It is intended for use in the large space ships of the future. But it may have other more down-to-earth applications.

Basically, the patent, issued to Robert P. Haviland and called a liquid flywheel, involves endless pipes arranged as hoops at various angles in a craft. They contain a fluid, usually a metal such as mercury which is liquid at ordinary temperatures.

The liquid is pumped through the hoops to stabilize the vehicle and offset tendencies to roll and pitch.

Will Head USSR Show

Harold C. McClellan, a Los Angeles paint manufacturer, will be the general manager of a U. S. trade exhibit in Moscow next summer.

Mr. McClellan was named to the unusual post by President Eisenhower, who said he hopes the exhibit will give a "truly representative" picture of this country. It will be the first official U. S. exhibit in the Soviet Union.

Officials of the trade exhibit, at the direction of the President, will "seek the advice and counsel" of industry and business executives in all fields.

Lukens Electric Furnace

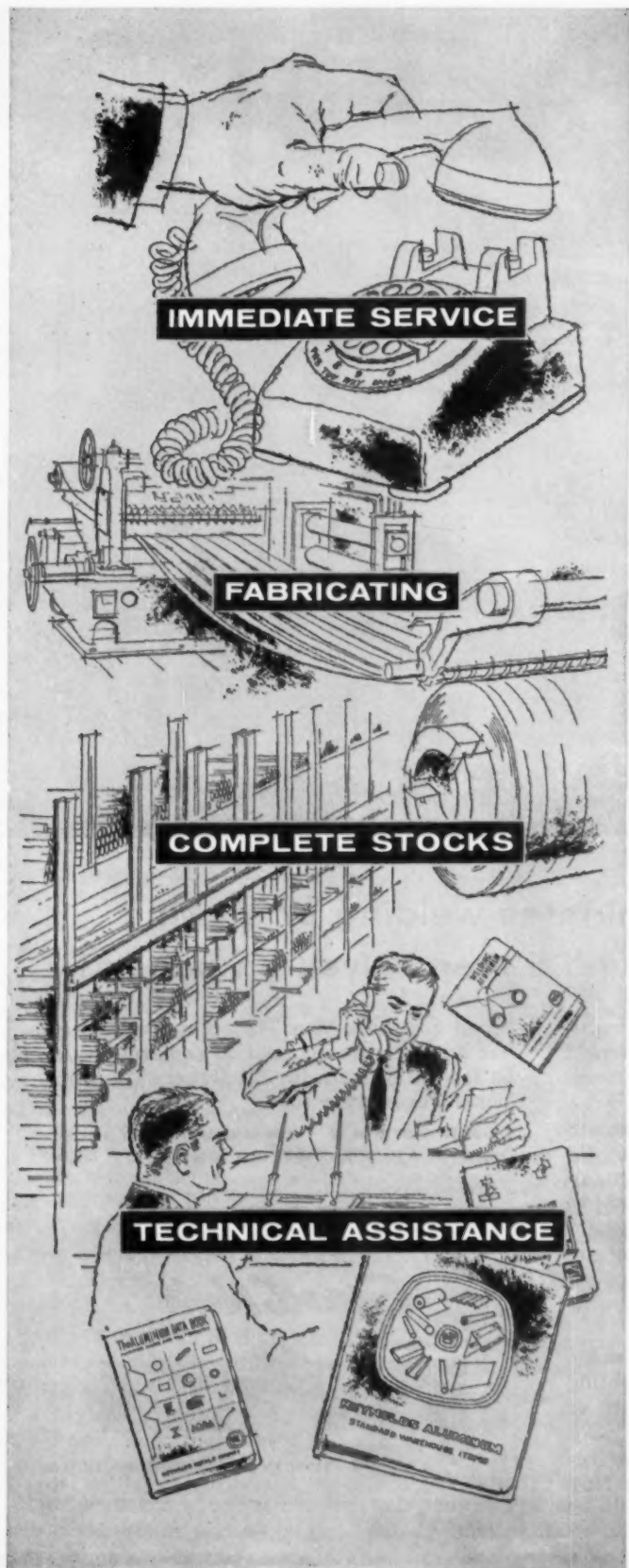
The second in Lukens Steel Co.'s three-phase expansion project has been completed. The company is now pouring heats in its new electric steelmaking furnace.

It is expected to up Lukens capacity 24 pct when it is ready for full commercial production. It will melt 100 tons of steel in each heat.

An Aluminum First

What are believed to be the world's first all aluminum refrigerator cars are now in service with Canadian National Railways.

The five cars are said to be 22.5 pct lighter than conventional refrigerator cars, saving about 14,200 lb of dead load.



Where to get Aluminum PLUS:

from your
Reynolds Distributor

When you're buying aluminum, you often want *more* than metal. Quality is vital, of course. So is *service*—delivery, technical assistance, and often fabrication.

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SPEED GRIPS® hold themselves on panels!**

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Thornton W. Whipple

A New Twist to Wire Promotion

How does a small company create and expand markets?

One answer is supplied by this wire products executive: Put the show on the road.

■ For the 100th time next month, Thornton W. Whipple will emerge from behind a network of wire shapes at Wilmington, Del., and tell his story of wire at work.

His spiel will most likely sound just as convincing to the Wilmington chapter of the National Assn. of Purchasing Agents as it did the first time he made it five years ago before the Vestal, N. Y., chapter of the American Society of Technical Engineers.

Sales Lever—While Mr. Whipple—vice president-sales, E. H. Titchener & Co.—is a specialist in design and use of wire products and components, his selling technique has universal appeal.

An on-the-spot seminar-type presentation is one of the most effective educational and sales promotional tools available to the small, diversified manufacturer, he claims.

Positive Results—How effective has his own presentation been? Since Mr. Whipple first dumped a box of welded wire assemblies on the floor before the Vestal engineers in 1953, sales at Titchener have increased 45 pct.

Scores of new wire products can be traced directly to his seminars—TV tube mounts, decorative grilles for radio and TV sets, high-style chair backs, door frame anchors, marine hardware, and many others.

How It Began—The traveling seminar idea got its start about 10 years ago, Mr. Whipple explains.



T. W. WHIPPLE: An on-the-spot presentation is most effective.

Prospects who sent in a print of a wire product for quotation would get two quotes: one duplicating the print, the other incorporating suggestions from Titchener's own 70-year experience in the wire goods industry.

The approach paid off. In 1953, the company installed a complete sample-making department—literally a miniature plant within a plant—where inquiries could promptly be followed up with Titchener-designed samples.


With a fast-growing backlog of successful redesign jobs, Mr. Whipple saw the advantage of taking these products—both “before” and

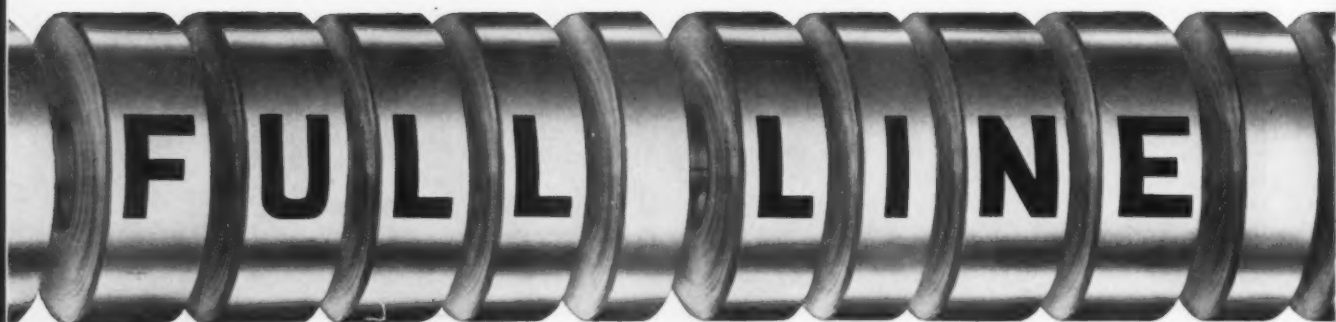
“after” versions—and physically presenting them to potential customers on their home ground.

Civic Live Wire—At least 6000 persons have seen Mr. Whipple in action. The company estimates that about 85 pct of all its order originate from samples developed in its lab and of these, over half are directly attributable to Mr. Whipple's presentations.

Mr. Whipple brings to civic groups in Binghamton, N. Y., the same brand of enthusiasm. One of his many local activities: vice president of the Live-Wire Club, a working body of the Binghamton Chamber of Commerce.

a wide selection...

from  STAINLESS and STRIP DIVISION
restricted and standard specification
cold rolled strip steel



Let's examine this "Full Line" product list of cold rolled strip steel. At J&L it includes all carbon grades, coated and uncoated, alloy, stainless and tempered spring steel. It offers all thicknesses from .001" or less to .156" or more, in widths from 1/4" to 24"—and tolerances for gauge and width closer than standard when required. There are "Full Line" advantages, too, in a range of controlled tempers and structures possible only with the variety of annealing,

heat treating and rolling processes found at J&L.

Your "Full Line" benefits can start by specifying J&L because only J&L makes standard and restricted specification cold rolled strip steel in such a wide range of analyses, grades and sizes to accurately meet the most exacting need.

For Strip Steel, call the Strip Steel Specialist — J&L.

J&L STAINLESS AND STRIP DIVISION produces a full line of restricted and standard specification strip steel in these grades and types:

Low Carbon
High Carbon
Tempered Spring Steel
Electrolytic Zinc
Alloy
Stainless



Jones & Laughlin
STEEL CORPORATION
STAINLESS and STRIP DIVISION
YOUNGSTOWN 1, OHIO

How Consumers Paced Recovery

Resiliency of consumer spending surprised many of the economic analysts.

It points out that the recent recession, severe as it was, was spotty. Employment and wages in many areas remained high.

▪ One of the most surprising aspects of the business recovery is the consumer's ability to bounce back.

Willingness to re-enter the market for major purchases, even before the recovery was well under way, amazed many. In fact, it is one of the reasons why the business build-up has been more rapid than predicted.

Recession Was Spotty—It was assumed, with logic, that buyers would move with extreme caution. The reverse has been true. Although you could hardly say buying is not cautious, the restraint has been much less than expected.

What this points out is that the recession period, serious as it was, was spotty in nature, not total or universal. Spending on services continued to grow throughout the period and spending for many manufactured products suffered little, if any.

Money Was There—It appears now that those who referred to climbing savings had a point, although it would have been difficult for a laid-off auto worker to agree that the economy was basically sound while he went on relief.

The result was a paradox of distressed areas, both in terms of industry areas as well as geographic areas, while others, if not booming, continued in relative prosperity.

Wages Up—Average weekly gross earnings in the durable goods

industries declined from a high of \$89.06 in August, 1957, to \$86.46 in February of this year. For those who continued to work, it represented only the loss of some overtime, in all probability.

And, note this, the figure for September of this year was \$92.23. This, obviously, points out that wages, like many prices, continued up in a period when, according to the law of supply and demand, they should have dropped.

Ready for the Upturn—What it boils down to is this: In spite of the serious effects of the recession on certain areas, enough workers continued to be employed at good

wages to keep the economy from collapsing.

When indications were that the bottom of the recession was reached, and some confidence was restored, they were in a position to buy needed hard goods.

The same goes for the housing market. When money eased last summer, plenty of prospective home buyers appeared. This would not have occurred if the country as a whole was demoralized, regardless of how advantageous the terms.

However, some industries are not out of trouble yet and the lag in employment has many concerned. It may be the one dark spot.

Wall Street Worries Business

With Apprehension—Many businessmen, and not just financial experts, are eying the stock market with increasing alarm.

The reason: The growing evidence that the upsurge in Wall Street is based less on confidence in the strength of business, and more on the conclusion that more inflation is inevitable.

While the movements of the stock market defy a simple analysis, the drop in the bond market in contrast to the extremely bullish stock market points to an inflation psychology in the financial world.

Point of Concern—This is disturbing to the average businessman who is fighting inflation in his own plant. Generally, he distrusts financial speculation to some extent anyway. He is seriously worried when that speculation is based on the psychology of inflation.

He likes to see his company's stocks go up, but only if he believes

the rate of climb is based on estimates of his company's future growth and earnings.

Time of Reckoning For Auto Industry

With the settling of most General Motors local strikes, and with all of the new models now introduced, the time of reckoning for the auto industry is at hand.

Although GM's new lines are attention getters on the streets and highways, there is some feeling that the series of strikes hurt more than the auto leaders care to admit.

However, the economy has been able to move ahead in recent years without the impetus of record auto production.

But a lot does depend on what happens in auto sales this year, both in immediate effect on the economy and the direction the industry takes in the years ahead.

Magnesium Gets Set to Compete

Price Cuts May Touch Off Battle With Aluminum

Lightweight trend in auto industry spurs magnesium producers into action.

They hope to double their automotive business in next two years.—By H. R. Neal.

■ The auto industry's growing interest in lighter-weight materials, particularly aluminum, is stirring other groups to action. Latest to cast covetous eyes on this lush market is the magnesium industry.

The magnesium industry is setting out to take away from aluminum some of the markets it has taken from other metals. And it intends to use the same arguments against aluminum as that industry uses in making its gains—lighter

weight with its accumulating advantages.

Four-Fold Gain?—Presently plagued by an unfavorable "cost" relationship with other metals, notably aluminum, the industry is hinting a price upset is in the making—maybe only months away.

A prediction that auto industry consumption of magnesium would more than double in the next two years was made by E. L. Schaper, manager of die casting sales, and H. A. Schertel, automotive development engineering for Dow Chemical Co. And a four-fold increase is held to be "not unlikely" in the next few years. Their forecast was made at the 14th annual convention of the Magnesium Association, held in Detroit.

Lightweight Trend—Part of the optimism is based on the fact that "only in the past few years have American automakers started to become lightweight conscious," Mr. Schaper said. "Until then, their interest in light metals was based solely on cost."

Cost is still a primary consideration, he admitted, and is the reason magnesium has fared badly in competition with aluminum in recent years. Even a doubling of magnesium usage is not likely to threaten aluminum's recent gains. But to a primary metals industry measuring its output in pounds, any gain is significant.

Cost-Weight Argument—Dow is still the only commercial producer of magnesium in the U. S. In 1957 the company, with an annual capacity of 170 million lb, produced 158 million lb. Only about 3 pct of the metal went directly into automobiles—less than an average of one pound per car. Additional amounts found their way into automobiles as an alloying agent for aluminum.

The current price for aluminum pig is 24.7¢ per lb while magnesium is 35.25¢—nearly a 50 pct difference. But the per-pound price doesn't tell the true story, Mr. Schaper insists. Magnesium is a full third lighter than aluminum, he points out. Thus, the volume of a pound is a third greater. Shipping costs are reduced. Handling is simplified.

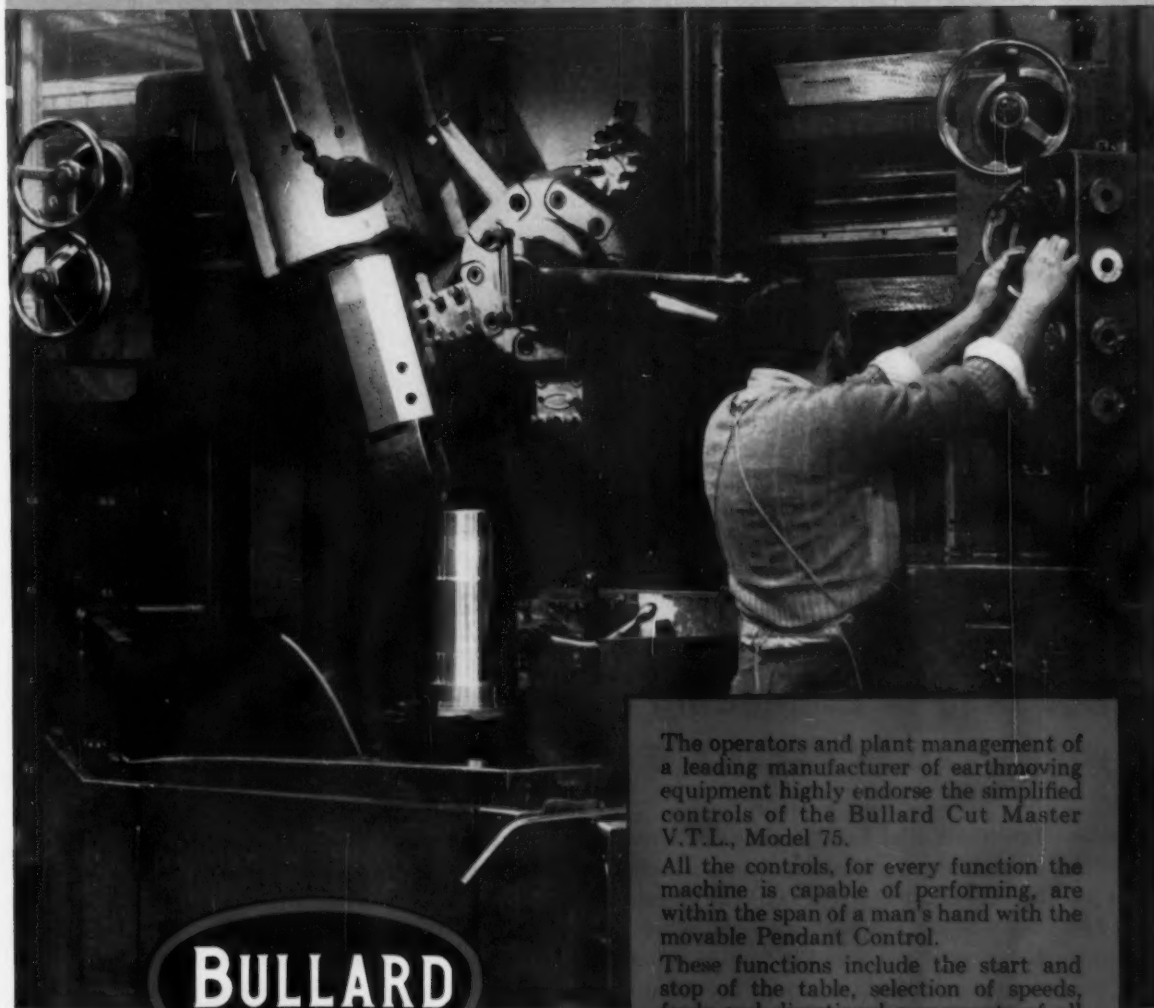
Price Cut Coming—Mr. Schaper believes magnesium will be fully competitive with aluminum when price difference is reduced to 20 pct. There were hints at the meet-

1959 Edsel Aims at Narrower Market



NEW MARKET POSITION: Ford Motor Co. believes it has found the right market niche for the Edsel—just above Ford in price. The 1959 line has been cut to 10 models in three series: Ranger, Corsair (shown above), and Villager station wagon.

Simplified Controls win enthusiastic approval



BULLARD

The Bullard Company
Bridgeport 9, Conn.

The operators and plant management of a leading manufacturer of earthmoving equipment highly endorse the simplified controls of the Bullard Cut Master V.T.L., Model 75.

All the controls, for every function the machine is capable of performing, are within the span of a man's hand with the movable Pendant Control.

These functions include the start and stop of the table, selection of speeds, feeds and directional movements of all heads in feed or traverse.

This feature, a Bullard exclusive, improves the efficiency of the operator and increases production.

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Voss-patented design features offer unusual precision and flexibility. Work rolls are backed by a multiple

system of individually adjustable back-up rollers, and, combined with simultaneous roll bend and longitudinal and radial tilt, provide area pressure control on any section of the work. Compact and trouble-free, Voss Roller Levelers are engineered to level hot or cold-rolled sheet, coil, strip or plate as well as non-ferrous metals. Let us demonstrate the advantages leading steel producers are enjoying through the use of Voss Inverted Roller Levelers.



Automotive Production

WEEK ENDING	CARS	TRUCKS
Oct. 25, 1958	69,599	16,288
Oct. 18, 1958	45,387	14,209
Oct. 26, 1957	104,987	21,543
Oct. 19, 1957	72,180	21,064
TO DATE 1958	3,043,557	659,663
TO DATE 1957	4,090,139	887,571

*Preliminary Source: Ward's Reports

ing this day is not far off.

Calumet-Hecla and Brooks and Perkins, Inc., have revealed they are combining to build a high-purity magnesium producing plant in Selma, Ala. Work on the plant is expected to start Nov. 1 and limited production to be underway by Aug. 1, 1959, with full production to be reached by the end of next year.

Different Method Used—Initial capacity is scheduled for only 7000 tons annually, compared to Dow's capacity of 85,000 tons. But a Brooks and Perkins spokesman said the new plant is planned with rapid expansion in mind.

Dow and the new company will use different methods of producing magnesium. Dow currently extracts the metal electrolytically from sea water. The new company will employ a thermal process to extract it from dolomite. In the latter process, crushed dolomite ore and ferro-silicon are heated with natural gas. Magnesium is given off as a vapor and collected on retort baffles.

Neither company would comment on cost comparison for the two processes. However, a representative from the Bureau of Mines pointed out Canadian producers using the thermal process are able to offer magnesium to the U. S. at a competitive price despite an import duty.

The Scoreboard—The two Dow men point out that since 1950 some 200 to 250 automobile parts have been manufactured from magnesium. Largest magnesium parts used in U. S.-built production passenger cars have been a 5.25 lb clutch

housing and a 7-lb torque-converter housing.

Chrysler Corp. used 10,000 of the clutch housings and 3000 of the torque-converter housings in the early 1950's with satisfactory results. Eventually, final cost killed the project.

Wheels Potential—Counting these and a number of other parts, 58 lb of magnesium are already successful production items, they point out. Uses for another 22 lb have proven serviceable but not put into production for economic reasons. These latter include glove-compartment doors, interior door handles and window cranks, etc.

Magnesium wheels are successfully used on racing cars. John A. Main, engineer with Kelsey-Hayes Co., a large supplier of automobile wheels, believes mass application of magnesium wheels to passenger cars won't be accomplished until the price of the metal is more competitive with other metals.

Other Uses—Another 271 lb of applications are currently being investigated or should be investigated.

These include magnesium engine blocks, pistons and cylinder heads,

Some foreign cars currently use comparatively large quantities of magnesium, particularly in castings. The Volkswagen, for example, uses about 38 to 40 lb of the light metal. Most of it goes into the head and crankcase for its engine.

Norwegian Source—However, the German automaker obtains its magnesium from Norway for about 28¢ per lb—nearly comparable to the price of aluminum in the U. S. While Norway produces the metal through a process similar to that used by Dow in the U. S., it is able to do it more cheaply because of low-cost hydroelectric power.

Corrosion resistance, less favorable than aluminum, is not expected to be a factor holding up magnesium applications. Nor are the problems connected with segregation and disposal of magnesium scrap, especially turnings. When the price comes down, the magnesium industry believes it can make a successful play for a sizable piece of the automobile business.

THE BULL OF THE WOODS

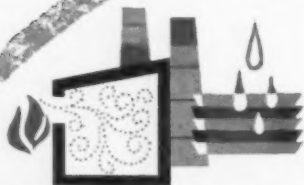


KAISER ENGINEERS

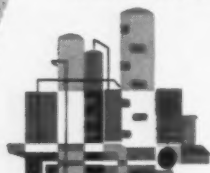
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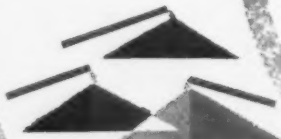
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By-products plants



Ore beneficiation and handling



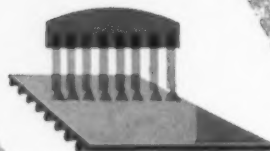
L-D Process plants



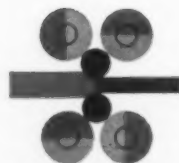
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Economy May Hit New High in '59

Government and Business Agree on Bright Prospects

Gross National Product could reach \$450 billion annual rate next year.

Important economic indicators are on the rise after period of slump.—By G. H. Baker.

▪ New industrial orders, plus stepped-up government spending, are putting some much-needed zing into the business picture.

That's the official view of the Administration's business experts. And these experts are also predicting a steady rate of improvement in the nation's economy for at least the next six months.

New High Possible—If nothing happens to reverse the trend between now and next June, gross national product sometime next year will pass the all-time high of \$445,600,000,000 (annual rate), set in the third quarter of 1957. The annual rate of GNP could exceed the \$450 billion mark next year.

These bright predictions reflect the thinking of not only the Administration, but also of rank-and-file federal economists who operate outside the area of partisan politics.

Businessmen Agree—This optimistic thinking generally jibes with that of the Business Advisory Council of the U. S. Dept. of Commerce, a group of top industrial management men who semi-annually submit their views and business forecasts to the Secretary of Commerce.

In addition to their predictions for a hefty gain of \$10 billion in gross national product during the next 12 months, the Administra-

tion's inner circle economic experts also say industrial management can expect these other developments:

Other Bright Spots—National income is on the rise. In 1959, the previous peak (\$364 billion in 1957) may be passed. Better demand for automobiles, homes, and consumer goods is in the making.

Farm income, too, is on the rise. This points the way to increased sales of farm machinery and equipment.

Corporate profits, after a nine-month downtrend, are on the way up.

Private domestic investment climbed back to \$54.5 billion (annual rate) in the third quarter of this year, and is still rising.

Spending for new plant and equipment is on the rise, following a prolonged sag from the peak 1957 levels.

Caution Signals—The only pos-

sible flaw in the outlook is that recovery may come too fast and go too far. Too much prosperity too quickly would only bring uncontrolled inflation. Some experts privately say the stock market is getting out of hand, and they hope to prevent similar inflationary pressures from affecting the economy.

Freight Rate Boost

Shippers will pay 15 pct more for most goods sent by the railroad-owned Railway Express Agency.

The Interstate Commerce Commission has granted the firm most of a requested 15 pct rate boost, which will raise its revenue by close to \$40 million a year. The ICC, in approving the request, ruled that present revenues were insufficient. But it also warned the agency to improve its service or expect to lose more traffic to competing shipping service.

Labor's New Strategy On Right-to-Work

Here's the latest AFL-CIO strategy for combating state right-to-work laws: Elect a pro-labor Congress, which would repeal the section of the Taft-Hartley labor law that authorizes states to enact right-to-work laws.

If this can be accomplished, all state right-to-work laws will automatically be wiped out in a single stroke. (Up to now, labor's strategy of combating right-to-work laws has been to attack them in states where the issue arises.)

There's a definite possibility that the new Congress (to be elected on Nov. 4) will be strongly pro-labor and will do the bidding of the AFL-CIO hierarchy on all economic matters. This could mean an end to all right-to-work laws.

In the Senate, Democratic leaders are talking cheerfully about increasing their present 49-47 edge by as many as a dozen seats. In the House, there's talk in Democratic circles of gaining as many as 40 seats over the existing 235-200 division in favor of the Democrats.

Farwest Develops a New Market

Demand for Missile Support Gear Increases

West Coast firms are finding a growing sales area in ground support equipment for aircraft and missiles.

GSE items are more expensive and complex than the missiles themselves.—By R. R. Kay.

Missilemaking will soon get going on a much bigger scale. With it, there's a built-in explosive demand for support gear. West Coast metalworking and aircraft firms foresee it. And they're going after the business hammer and tongs.

Although missiles are the "glamour girls" of the day, support equipment is too often thought of

as a stepchild. But that's not so. Every month the Air Force adds 12,000 new supply items to its inventory.

Many Items Non-Standard — Ground support equipment (GSE) is even more expensive and complex than the missile. For every \$1 spent on the airborne package, \$1.50 to \$2 goes to support it.

There's a huge aircraft and missiles support market. Example: About 75 pct of a modern bomber squadron's GSE is non-standard. When a new bomber goes into production, much GSE becomes obsolete.

Converting an F-84F squadron to F-100's takes about 220 new

GSE items. And some 300 new ones are needed in the changeover to F-104's. Most often this equipment is not standardized.

Reinforcing Bar Mill Coming in Hawaii

Predictions that Hawaii would get a steel mill (See The IRON AGE, March 14, 1957, p. 111) are coming true.

Hawaiian Western Steel, Ltd., is putting up \$1.5 million to get the project underway. And the semi-integrated mill should be in limited production next spring.

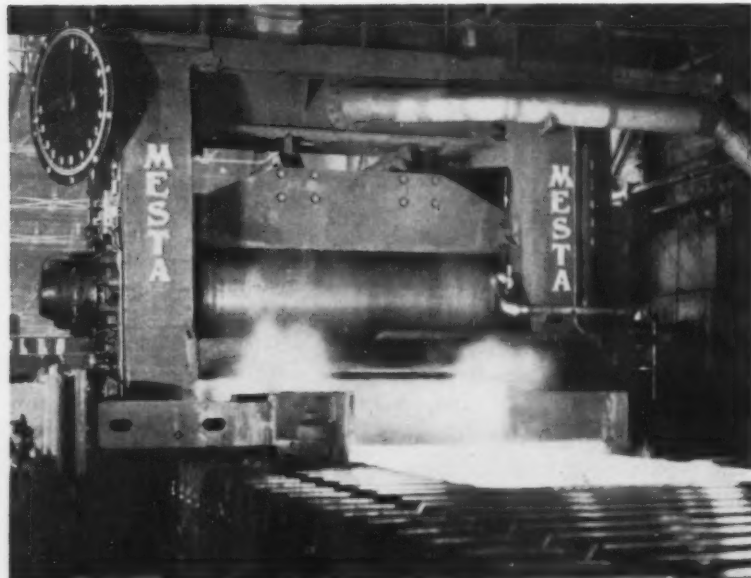
Here's the deal: Hawaiian money got together with Canadian steel-making skill. Western Canada Steel, Ltd., Vancouver, B. C., is supplying technical aid and equipment. The works, including an electric furnace, will be set up at Pearl Harbor on the Hawaiian Electric Co.'s property.

Ingots Shipped In—At the start, Western Canada Steel will ship ingots to Hawaii. The mill should be making at least 10,000 tons of reinforcing bars during its first year. Planned capacity: 25,000 tons by 1961.

The Islands generate some 40,000 tons of scrap a year—half of it electric furnace grade. The building industry there is going great guns. Right now it requires 20,000 tons of reinforcing bars a year.

Who's in Charge—Officers are: Philip E. Spalding, Jr., president; Gerald H. D. Hobbs, first vice president; Lowell S. Dillingham, second vice president; Hung Wo Ching, treasurer; Milton Cades, secretary.

Kaiser Steel Starts Up New Plate Mill



MILL MAKES WIDE PLATE: Kaiser Steel has put in operation its new, 148-in., 4-high reversing plate mill at Fontana, Calif. It can turn out plate up to 126 inches wide, the widest ever rolled in the Farwest.



**"We just don't worry
about chipping
or flaking
when we lock-seam
WEIRKOTE!™"**

If those difficult lock-seaming operations give you trouble, it's time to take the step that fabricator after fabricator is taking.

Switch to Weirkote zinc-coated steel as promptly as you can.

Weirkote's continuous process integrates the zinc and the steel so that the most complicated forming operations are made without chipping or flaking. Weirkote can be worked to the very limits of the steel itself—spinning, deep drawing, crimping, heading, twisting, the works. Comes through in perfect shape to give your products lasting anti-rust protection, such as they've never had before.

Can you think of a quicker, easier step to an even better product? To fewer rejects? To more peace of mind? To lower costs? And, perhaps most important, to the greater good will of customers who receive even more value for their money?

Write today for the free booklet that will give you lots of food for thought on the many advantages Weirkote can bring to your products and production. And *now* Weirkote is treated to inhibit wet storage (white oxide) stain. Weirton Steel Company, Dept. A-1, Weirton, West Virginia.

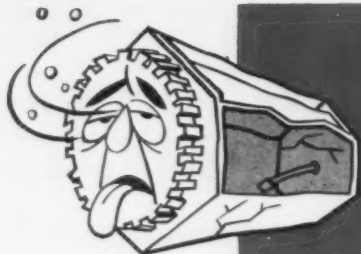


**WEIRTON STEEL
COMPANY**

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION



**"DON'T GET CAUGHT
WITH YOUR PLANTS DOWN!"**

Have UDYLITE repair, replace plating barrels NOW...at low cost!

Get ready today for tomorrow's upswing in business! Have your plating facilities geared to peak performance . . . avoid the risk of costly down time during peak periods of production. Take inventory of your equipment needs . . . and the condition of your plating barrel equipment. Then let your

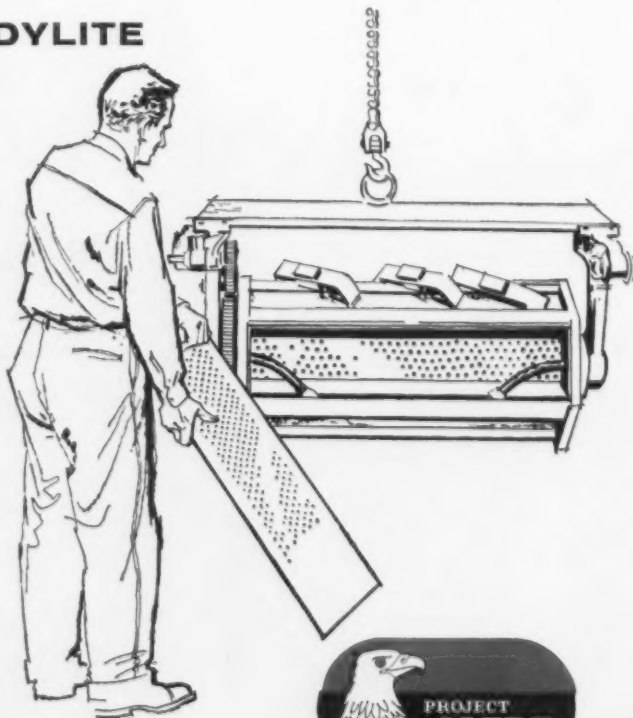
Udylite sales engineer give you on-the-job quotations for repairs or replacements. When your equipment is sent to Udylite . . . you are guaranteed a definite return delivery date. A special department handles your order all the way through . . . costly down time is kept to an absolute minimum.

REPAIRS OR REPLACEMENTS BY UDYLITE

OFFER THESE ADVANTAGES:

- 1 IMMEDIATE QUOTATIONS** given by Udylite salesman right in your shop!
- 2 ALL REPAIRS or REPLACEMENTS WITH GENUINE UDYLITE PARTS!** You're assured of finest Udylite engineering, highest quality!
- 3 PARTS FACTORY INSTALLED** by trained barrel equipment specialists.
- 4 FAST, GUARANTEED DELIVERY** of equipment sent to Udylite. Special department set up to expedite your order.

Let Udylite help you get your entire plating operation in top working order, ready to go at top capacity. Your Udylite sales engineer will soon be calling on you. But if you need priority service write, phone or wire directly to:



the udylite corporation
detroit 11, michigan • world's largest plating supplier



How to Land More Tool Orders

Distributors Are Told There's no Slick Short Cut

It was standing room only at the AMTDA meeting as members came looking for answers.

**They got a straight story from outgoing president Habicht.—
By E. J. Egan, Jr.**

■ Most machine tool distributors can still whip up a convincing grin when they say, "There's nothing wrong with me that an order won't cure."

It isn't easy to be that jaunty. For over a year now, ready buyers for new machine tools have been scarcer than canaries at a cat show.

Full House—Seeking hints for a cure for this new-order anemia, members of the American Machine Tool Distributors' Assn. decended on Boston's Sheraton Plaza Hotel, for their 34th Annual Meeting. It was standing room only.

Association officers and guest speakers handed out no pap about boom times being right around the corner. But outgoing AMTDA president Frank H. Habicht, president and general manager of Chicago's Marshall & Huschart Machinery Co., said he was convinced "this recession had a few blessings mixed with it."

Breather—He likened the current slump to a "breathing spell," a good chance for members to get in some constructive licks on; (1) personnel training, (2) management and distribution techniques, (3) advertising and public relations, (4) lining up solid market information for the builders they represent.

Habicht said flatly there is no "slick short cut" to level out the industry's economic cycles. "The answer is simply hard work and

building for the future with research, manpower, and management."

R and D—He hammered hard at the research and development angle, emphasizing its importance in two ways. Customers will be using it to create a "substantial market for machine tools during the next two years. Over 12 pct of the tangible manufactured goods that will be

sold in 1961 are items not available today."

Also: "Research and development is important to our own industry. We must accelerate our engineering to be sure [we] remain ahead of the world in machine tool technology."

On manpower, Habicht observed: "Increasing sales and marketing effort is outstripping our supply of the right kind of salesmen."



NEW OFFICERS: American Machine Tool Distributors' Assn. elected these men to the following positions: president, J. O. Ellison, Harron, Rickard & McCone Co., (top left); first vice president, J. Russell Clark, White Star Machinery & Supply Co., Inc., (top right); second vice president, George E. Merryweather, Motch & Merryweather Machinery Co., (bottom left); secretary-treasurer, I. B. Rabel, Star Machinery Co.

INDUSTRIAL BRIEFS

Search for Scientists — High school seniors throughout the country have been invited to compete for awards and scholarships totaling \$34,250 in the 18th annual Westinghouse Science Talent Search. Forty national winners will attend the 5-day Science Talent Institute in Washington, D. C., where they will vie for the five top scholarships.

Attention, Designers—The James F. Lincoln Arc Welding Foundation, Cleveland, is offering 54 awards totaling \$50,000 for papers describing the use and advantages of arc welding in the design and construction of machines or machine components. A booklet is available from the James F. Lincoln Arc Welding Foundation, Cleveland.

Stretching Out—A \$1.6 million contract calling for the construction of a rubber factory in Springfield, Mo., has been awarded to the Kretzer-McLean Construction Corp., Springfield. The new plant will be used primarily to manufacture mechanical goods for The Dayton Rubber Co. Completion of the plant will allow for further expansion of tire manufacturing at the company's Dayton, O., plant.



"I understand the Russians are ahead of us in some types of weapons."

Mission to India—Herbert Harig, president, Harig Mfg. Corp., Chicago, maker of tools, dies, and machine tools, has been selected by the U. S. Dept. of Commerce as a member of a six-man trade mission team to India. The tour is expected to take four weeks and wind-up Dec. 10 at the U. S. Sole Exhibit in New Delhi.

Potent Producer—The Bunker Hill Co., San Francisco, is planning to construct a \$10 million fertilizer plant in the Northwest. It is scheduled to go into production by July, 1960. The plant will have an annual capacity of 200,000 tons of fertilizer products, making it one of the largest in the Northwest United States.

Armour's Double Dozen — A \$1.2 million addition to the Metals Research Bldg. at Armour Research Foundation of Illinois Institute of Technology was dedicated on Oct. 20. The event marked the completion of the second step in a 10-year expansion program. The construction is the 24th new building in the over-all expansion and development program.

Welcome Addition—A new boring and reaming tool manufacturing firm, Muskegon Tool Industries, Inc., has been formed in Muskegon, Mich. It has started production of tools similar to those formerly produced by Madison Industries, Inc.

Strong Union — A modernizing program and joint use of research laboratories are two advantages to come from Superior Foundry Inc.'s acquisition of Allyne-Ryan Foundry Co. The purchase joins two of Cleveland's oldest gray iron foundries. Allyne-Ryan will be known as the Allyne-Ryan Div. of Superior.

High Powered Order—An order for 139 high-voltage disconnect switches, for the Niagara Switchyard of the Niagara Power Project, has been received by R&IE Equipment Div., Greensburg, Pa., of I-T-E Circuit Breaker Co. The order was awarded by the Power Authority of the State of New York.

Ninety Days Grace—The Material Handling Institute, Inc., Pittsburgh, announces a 90-day extension of the closing date for its Industry Awards Program within the metal stamping industry. Entries will now be received until Jan. 15, 1959. The program is endorsed by and conducted with the cooperation of the Pressed Metal Institute.

Garden State Home — Formal dedication and open house for the new DuBois Co., Inc., manufacturing plant at East Rutherford, N. J. is set for Nov. 5. DuBois, a Cincinnati-based firm is a manufacturer of institutional and industrial cleaning compounds. The plant cost over a million dollars.

All Star Casting—Titanium castings have been added to the line of mill products produced by Harvey Aluminum at its Torrance, California plant. Harvey Aluminum also fabricates titanium forgings, extrusion, bar, rod, impact extrusions, tubing, and billet stock in a range of sizes, shapes, and alloys.

Busy Crossroads—A new \$1½ million Ohio River Terminal at Armco Steel Corp.'s Ashland, Ky., Works has been put into operation. The Armco terminal is designed to handle hot- and cold-rolled steel sheets, coils, and special coated steels produced by the Ashland Works. It is also built to receive many of the steelmaking raw materials consumed by the plant.

Service Chief—At a recent annual meeting of the Service Tools Institute in New York, T. R. Hughes, vice president and general manager of the Utica Drop Forge & Tool Div. of Kelsey-Hayes Co., was elected president of the Institute for the coming year.

New England Route — Kelco Metal Products Co., Boston, has been appointed a distributor for Olin Aluminum mill products of Olin Mathieson Chemical Corp. Kelco will distribute Olin Aluminum in Massachusetts, New Hampshire, Vermont, and Maine.

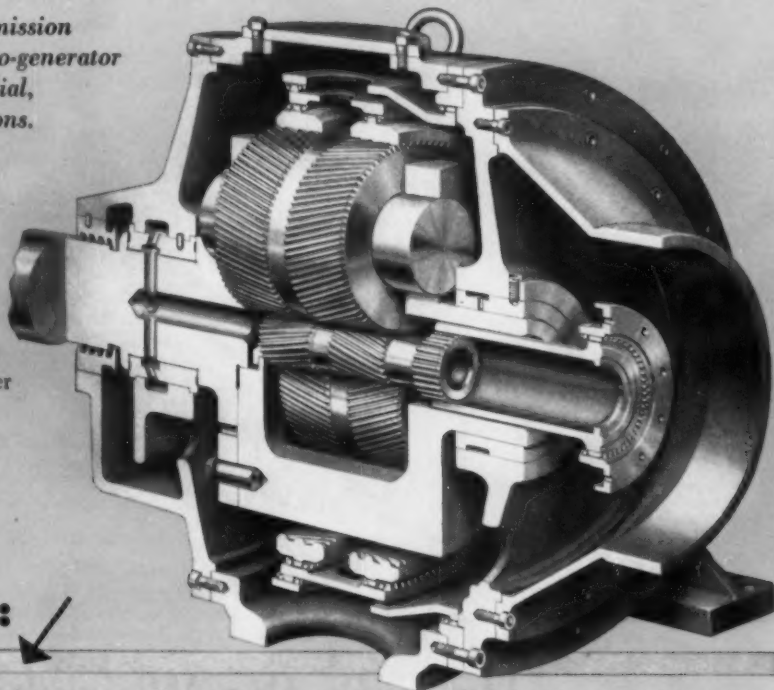
DE LAVAL-STOECKICHT PLANETARY GEAR

...for high speeds...high horsepower

**Proved in hundreds of installations abroad
totalling over 3,000,000 horsepower—now available in America!**

For all high torque power transmission applications such as pump turbo-generator and compressor drives in industrial, municipal and marine installations.

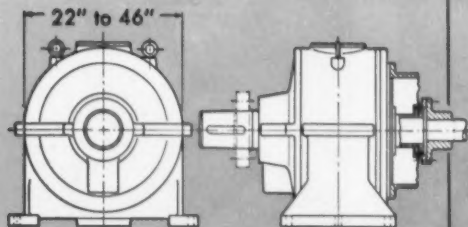
This cutaway view of the De Laval-Stoeckicht Planetary Gear shows how it provides flexibility for proper load distribution throughout the gear members. The thoroughly proved and tested design is completely reliable in transmitting high horsepower for high speed applications. • Highest efficiencies (98% or higher) ... no high speed bearings ... less friction losses.



**Check
These Advantages:**

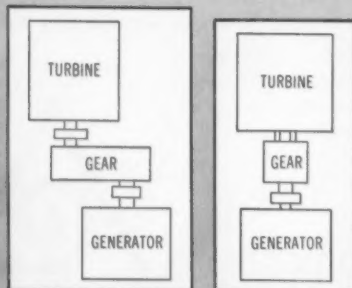
Small Size—Light Weight

Compact—low weight per hp. Sizes range from 22" to 46" in diameter, depending on horsepower requirements. Example: 5000 hp planetary unit weighs 1700 lbs. against 6000 lbs. for conventional gear.



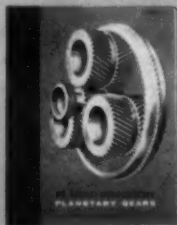
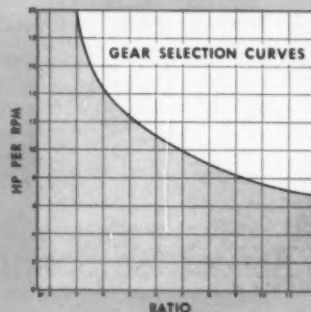
Convenient Arrangement

Co-axial or "in-line" arrangement of gear members takes up far less space than parallel axis gears of equivalent horsepower rating.



Wide Application

Capacity range shown in shaded area on chart below. For other applications, contact your De Laval Sales Engineer.



For further details,
write for Bulletin 2400.



DE LAVAL

Steam Turbine Company

899 Nottingham Way, Trenton 2, New Jersey



Up with the Whirlybirds . . .

What helps this helicopter hover? It's an engineering principle — angle of tilt of rotor blades and speed of revolution. What's at the heart of the rotor assembly? Among other things, this rugged spring and tension bar made by an A.S.C. Division. The same exacting "aircraft quality" that produces these and hundreds of other high duty aircraft springs is available to manufacturers in any industry whose standards demand the best.

Write for a copy of "How to Solve Your Spring Design Problems" to learn how early consultation with the spring manufacturer results in improved design and performance.



Associated Spring Corporation

General Offices: Bristol, Connecticut

Wallace Barnes Division, Bristol, Conn. and Syracuse, N. Y.

B-G-R Division, Plymouth and Ann Arbor, Mich.

Seaboard Pacific Division, Gardena, Calif.

Cleveland Sales Office, Cleveland, Ohio

Canadian Subsidiary: The Wallace Barnes Co., Ltd., Hamilton, Ontario and Montreal, Quebec

Raymond Manufacturing Division, Corry, Penna.

Ohio Division, Dayton, Ohio

F. N. Manross and Sons Division, Bristol, Conn.

San Francisco Sales Office, Saratoga, Calif.

William D. Gibson Division, Chicago 14, Ill.

Milwaukee Division, Milwaukee, Wis.

Dunbar Brothers Division, Bristol, Conn.

Wallace Barnes Steel Division, Bristol, Conn.

MEN IN METALWORKING



D. B. Wiesley, appointed director of staff of Continental Can Co.'s Metal Division.

W. J. Stewart, elected president, The Cleveland Punch & Shear Works Co., Cleveland.

O. L. Wigton, named vice president, marketing, Hancock Industries, Jackson, Mich.

L. E. Nelson, named vice president, sales, Marine & Industrial Engine Div., Chrysler Corp.

J. L. Bush, appointed corporate controller, J. I. Case Co., Racine, Wis.

B. A. Willsey, will become vice president and general manager, Des Moines Div., Solar Aircraft Co.

George Gumas, appointed vice president, engineering, CDC Control Services, Inc., Hatboro, Pa.



H. M. Richey, elected vice president, manufacturing, Roller Bearing and Rock Bit Divisions, The Timken Roller Bearing Co., Canton, O.

J. K. Everhart, Jr., elected secretary and general counsel, Hagan Chemicals & Controls, Inc., Pittsburgh.

D. R. Berg, appointed manager, New Product Development Dept., Dravo Corp., Pittsburgh.

R. A. Shonk, promoted to vice president and general manager, General Refractories Co. of Canada, Ltd., Smithville, Ontario; **F. A. Moorecroft**, becomes asst. secretary and asst. treasurer.

R. W. Morefield, appointed manager, merchandise sales, General Electric Co., Plainville, Conn.

P. W. Krantz, named division accountant, Union Drawn Steel Div., Republic Steel Corp.

J. R. Casey, named general manager, User Industries Sales Dept., General Electric Co., Boston.

B. E. Magette, appointed general sales manager, Universal Mfg. Corp., Zelienople, Pa.

Harold Browning, named general superintendent, Bay City Foundry Co., Bay City, Mich.

Loy Collingwood, appointed assistant general sales manager, Riverside-Alloy Metal Div., H. K. Porter Co., Inc., Riverside, N. J.



E. P. Riley, vice president, named supervisor, Automotive Divisions, Thompson Products, Inc., Cleveland.



S. F. Cooper, appointed sales manager, castings, Cooper Alloy Corp., Hillside, N. J.

C. N. Wetherell, appointed manager, Systems & Procedures Div., Joseph T. Ryerson & Son, Inc., Chicago headquarters.

G. E. Wind, appointed assistant service manager, Clearing Machine Corp., a division of U. S. Industries, Inc.

W. N. Wyatt, named midwest sales manager, industrial chemicals, Phosphorus Div., Booker Chemical Corp.

F. C. Flynn, appointed district



L. F. Corp, promoted to asst. division manufacturing manager, Central Foundry Div. of General Motors Corp.

LOOKING FOR MORE FROM

Trim steelcutting costs with Carboloy® Extra-Performance Grades 330, 350, and 370, and low-cost, General-Purpose Grades 78 and 78B

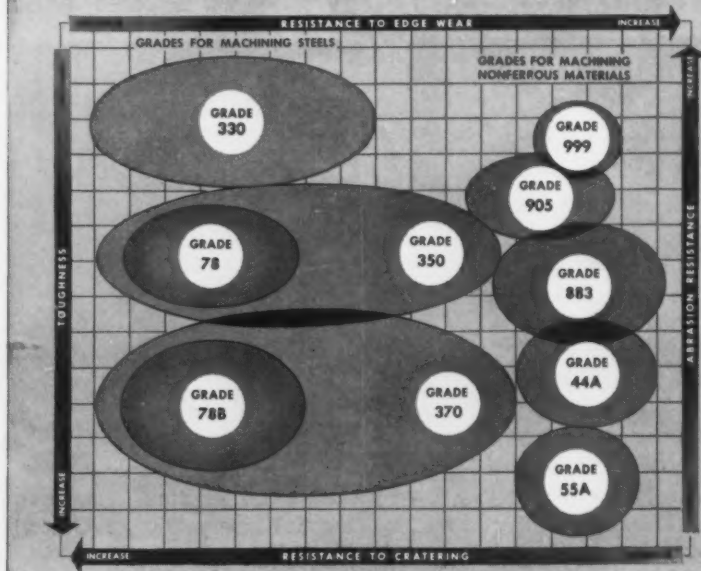
Some steelcutting jobs call for extra-tough, extra-performance carbides. Others can only be handled profitably with low-cost, general-purpose carbides. That's why we make them *both*.

Where you need increased machine productivity and have long production runs, to keep cost-per-piece low use Carboloy Extra-Performance Series 300 carbides. Their added strength and stamina handle jobs ranging from heavy roughing to high-speed finishing . . . at a cost and rate no "premium" carbide on the market can beat.

But, for general-purpose steelcutting jobs that don't require the Extra-Performance carbides, use Carboloy Grades 78 and 78B. Their top-notch performance, at low initial tool cost, will keep your machines operating profitably.

Chances are, your plant should be using *both* grades. Your local Authorized Distributor of Carboloy cemented carbides can deliver tools, blanks and inserts you need . . . in a hurry.

This complete team of Carboloy cemented carbides gives you more for your carbide tool dollar!



YOUR CARBIDE TOOL DOLLAR ?

Cut nonferrous materials
with low-cost Carboloy[®]
Grades 44A and 883 . . .
get longer tool life,
increase production rates

These Carboloy cemented carbides are performance-matched to your cutting job for optimum machine productivity.

For interrupted cuts and tough production runs, use Carboloy Grade 44A. High shock resistance and good wear resistance make this a versatile grade for all machining jobs where a rugged carbide is needed.

When your job demands a carbide with built-in stamina and high wear resistance for general-purpose machining of nonferrous materials, use Carboloy Grade 883. You will get longer tool life and lowest cost-per-piece.

There are 5 Carboloy cemented carbides for cutting nonferrous materials, including Grades 44A and 883. One of these is designed especially for the particular characteristics of your cutting job to give maximum tool efficiency. Job-matched performance of these Carboloy nonferrous grades means better value for your cutting dollar.

To find out more about Carboloy Extra-Performance and General-Purpose carbides, or low-cost nonferrous grades, call or write: Metallurgical Products Department of General Electric Company, 11157 E. 8 Mile Boulevard, Detroit 32, Michigan.

CARBOLLOY[®]
CEMENTED CARBIDES

GENERAL  **ELECTRIC**

sales manager, United Air Lines, Akron-Canton, O.

J. J. Sheehan, appointed general manager, International Div., Hewitt-Robins, Inc.

D. J. Leman, appointed manager, systems and procedures, Consolidated Electrodynamics Corp., Pasadena, Calif.

F. P. Lucier, appointed sales manager, Stanley Electric Tools, division of The Stanley Works, New Britain, Conn.; **E. W. Ellsworth**, named Northeastern region manager.

F. P. Szamier, appointed chief inspector, Hydreco Div., The New York Air Brake Co., Kalamazoo, Mich.

R. B. Dozier, appointed export sales administrator, International Div., Beckman Instruments, Inc.

S. P. Gaston, appointed special shape engineer, Kidd Works, Vulcan-Kidd Steel Div., H. K. Porter Co., Inc., Aliquippa, Pa.

R. W. Dollar, appointed Atlanta sales representative, Industrial Products Div., Warner Electric Brake & Clutch Co., Beloit, Wis.

C. C. Burke, appointed a sales engineer, Taylor Fibre Co., and assigned to the La Verne, Calif., sales office.

W. G. Kegel, promoted to general master mechanic, Vesta-Shannon Coal Division, Jones & Laughlin Steel Corp., California, Pa.

R. W. Brown, appointed railway and industrial sales engineer, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

G. H. Shima, named Western sales representative for the Continental-Diamond Fibre Corp., a subsidiary of the Budd Co.



R. J. Keyser, appointed manager, manufacturing, Home Laundry Dept., General Electric Co., Louisville, Ky.



A. J. Karam, promoted to plant manager, Saginaw Malleable Iron Plant, Central Foundry Div. of General Motors Corp.



Irving Whitehouse, appointed asst. director, research, Republic Steel Corp.



J. M. Schultz, named manager, technical sales, Aluminum Co. of America's Pigment Division.

H. D. Cupitt, appointed sales engineer, Philadelphia area, New York & New Jersey Lubricant Co.

OBITUARIES

C. M. Allen, president, Chas. G. Allen Co., Barre, Mass.

J. S. Freese, 54, general production manager, The Timken Roller Bearing Co., Canton, O.

R. W. Nelson, 48, vice president, American Air Filter Co., Louisville, Ky.

E. B. Mullen, 54, asst. manager, sales, U. S. Steel Corp., in St. Louis.

A. B. Schultz, 43, chief engineer, Stamping Div., Cleveland, Eaton Mfg. Co.

R. M. Fellows, 66, chairman of the board and treasurer, The Fellows Gear Shaper Co., Springfield, Vt.

V. A. Crosby, manager, automotive development, Climax Molybdenum Co., a division of American Metal Climax, Inc.

GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Four, Five, Six, Eight Spindles • Work and Tool Rotating Type
GOSS & DE LEEUW MACHINE CO. KENSINGTON, CONN.

Z I N C
STRIP AND WIRE
ZINC METALIZING WIRE
ZINC ACCURATELY ROLLED
for electric fuse elements
THE PLATT BROS. & CO., WATERBURY 20, CONN.



Inspection of 75-foot Salem Rotary Hearth Furnace at The Timken Roller Bearing Company plant at Canton, Ohio.

Rotary hearth roof of B&W IFB gives nine years of service at the Timken Company

Installed as a replacement for a super-duty firebrick sprung arch, over 35,000 B&W Insulating Firebrick were used in the roof of this rotary hearth furnace. Since installation nine years ago, just 300 9" equivalents have been used for maintenance—less than 1% replacement!

Throughout this period the furnace has been operated at temperatures

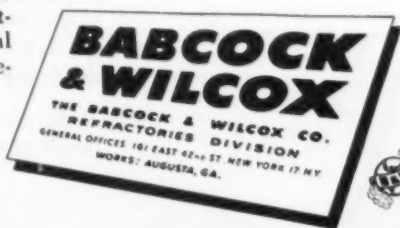
ranging from 2100 F to 2300 F on a continuous 6-day cycle at an average output of 20 tons per hour.

In addition to long service life, lightweight B&W Insulating Firebrick provide high fuel savings because of their low heat flow and heat storage. Lightweight IFB also simplify original furnace construction...make maintenance and patching easier.

For more information on long-lasting, cost cutting B&W Insulating Firebrick, consult your B&W Refractories Representative or send for Bulletin R-2-H.

B&W REFRACTORIES PRODUCTS:

B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick
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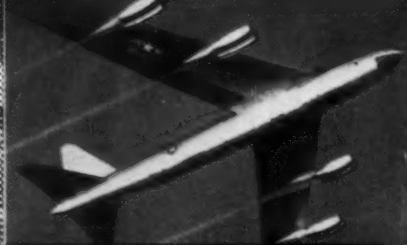
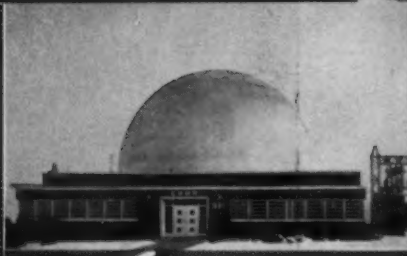
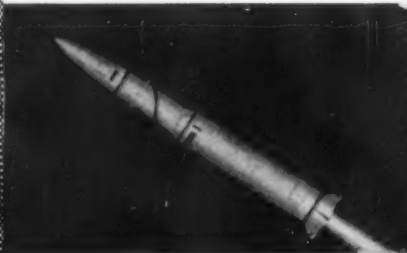
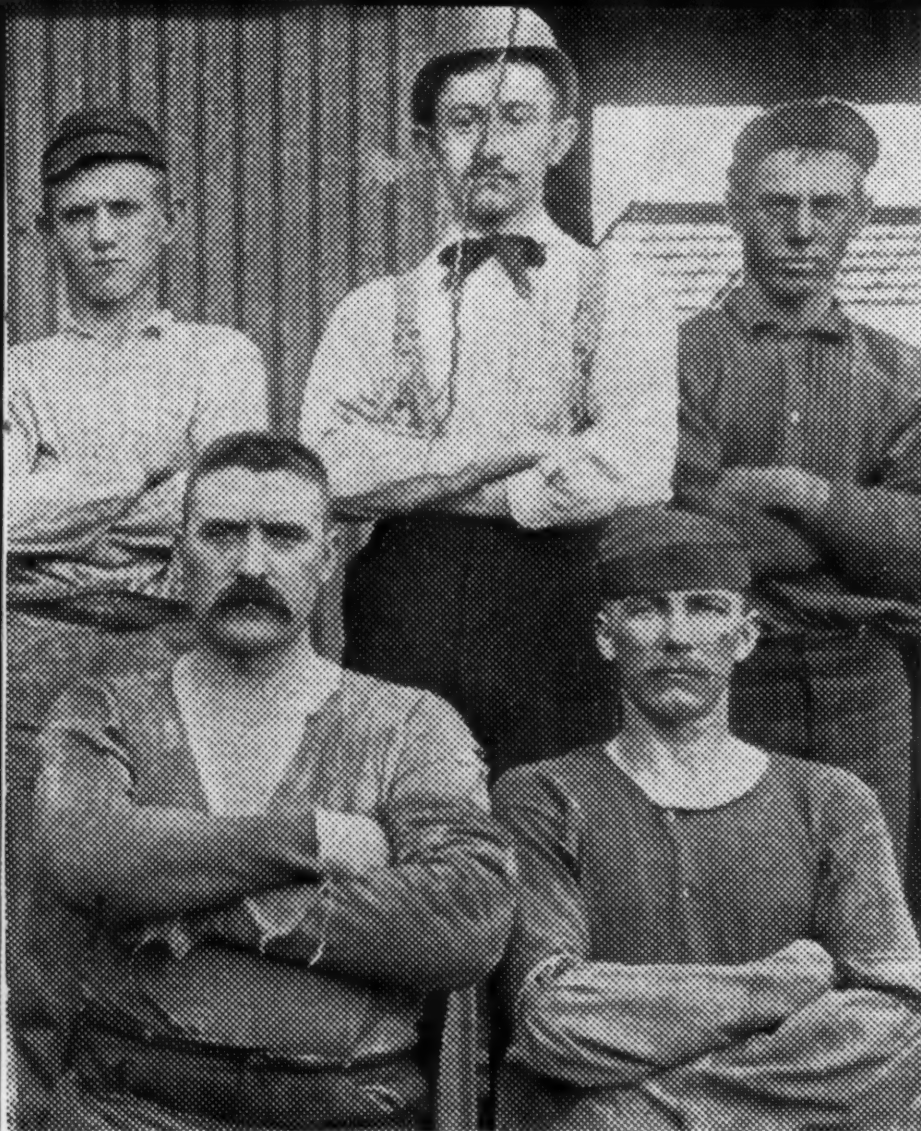


management problem Back in 1898, Tom Corbley (*front row, left*) and his Melting Crew were a proud and imposing lot. The Spanish-American War was on. And the nation's eyes were focused on the unique little mill in Reading, Pa., that was busy turning out the world's largest production of newly-discovered, armour-piercing projectiles.

Since 1898, the spectre of Tom Corbley's crew has presented a problem to *Carpenter* management that has been almost 70 years in the solving—how to apply the skills and pride of workmanship exemplified by Corbley's men, to the formulation, the production, and then the mass-production of the world's finest specialty steels.

Today the problem is solved. But it was a gradual process. Because *Carpenter* was born a small Mill, it has been free to grow slowly—to maintain purest quality in every pound of specialty steels it released to industry. Quality . . . and only the finest quality . . . before mass-production.

Today, both are possible. With the acquisition of steelmaking facilities in Bridgeport, Conn., *ingot tonnage capacity has*



ingot tons capacity doubled to meet
the needs of fast growing industries

1950

1958

been doubled almost overnight. Additional electric arc melting furnaces, rolling mills, new annealing and heating furnaces, and other finishing equipment . . . each with *Carpenter's* unique quality controls . . . started operating in the past year.

In the years ahead, *Carpenter* will continue to grow—to keep pace with the ever-increasing demands of industry—for the world's finest specialty steels.

tool and die steels

stainless steels

electronic and magnetic alloys

special-purpose alloy steels

valve, heat-resisting and super alloy steels

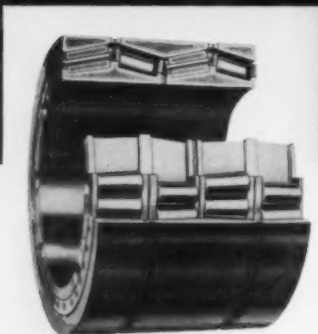
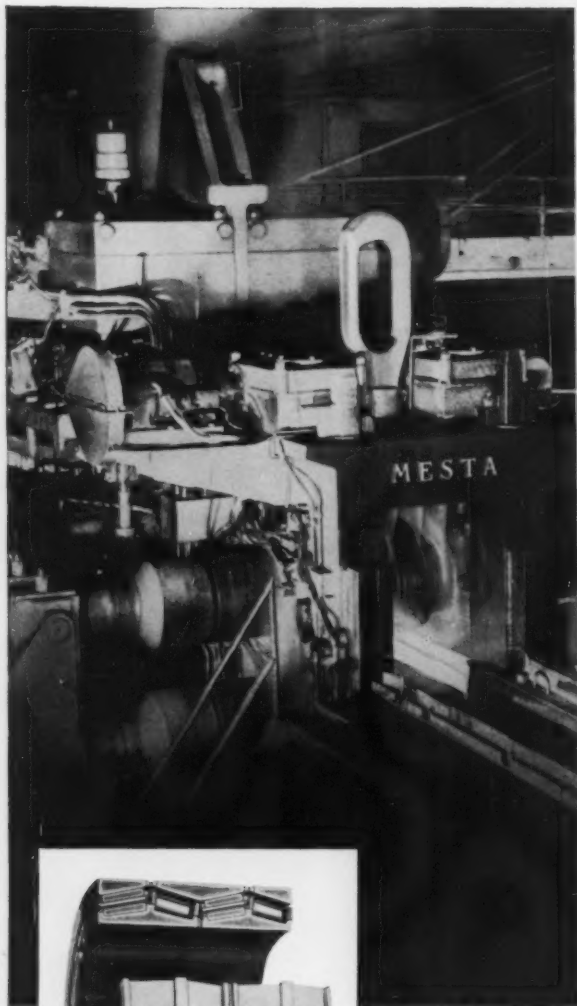
tubing and pipe

fine wire specialties

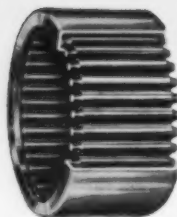
***Carpenter* steel**

*The Carpenter Steel Company, Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.
Webb Wire Division, New Brunswick, N. J.*





from
steel mills ...



to
farm tractors

Torrington makes the right anti-friction bearing for every basic need!

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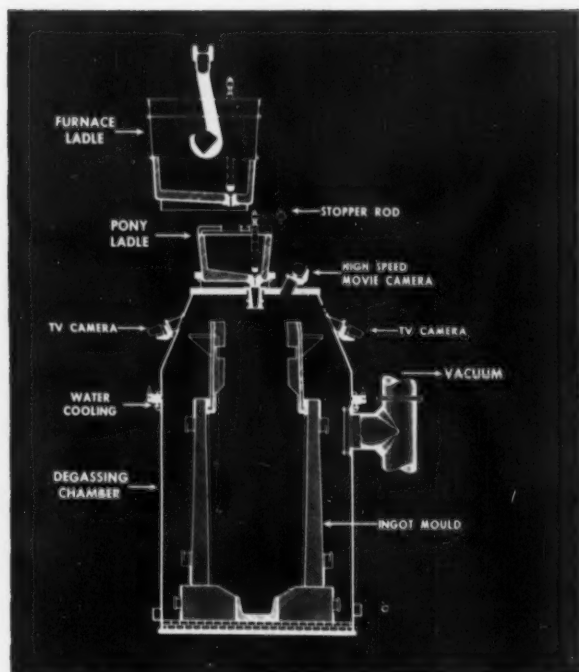
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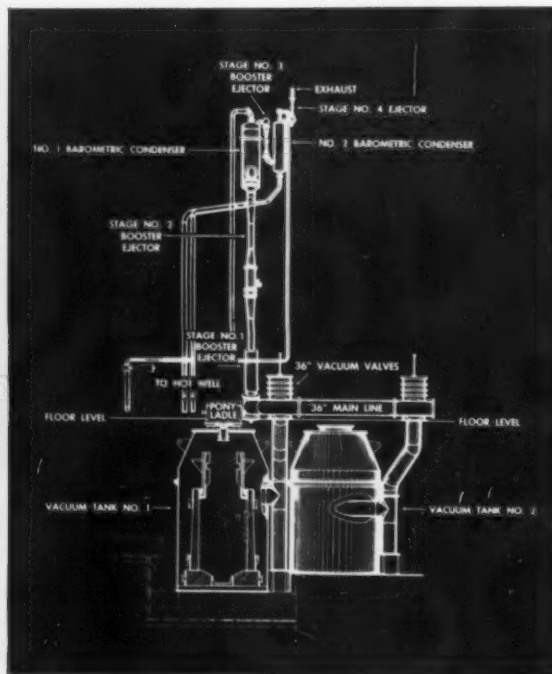
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INSIDE THE TANK: Vacuum removal of gases breaks the metal stream from the pony ladle into droplets.



STEAM SYSTEM: Common evacuator system links twin 250-ton pouring tanks, uses four steam-jet stages.

Vacuum Pour Giant Ingots To Make Flake-Free Forgings

Ruinous flakes and strength-sapping hydrogen embrittlement in giant forgings are well on the way out.

A practical vacuum pouring technique gets rid of these headaches.

■ Vacuum pouring 120-in. diam, 250-ton steel ingots to get sounder, cleaner, stronger forgings is fast becoming routine for Bethlehem Steel Co. Since June, 1957, the firm has poured nearly 300 such ingots of electric furnace steel in two huge vacuum degassing chambers.

Achieving a vacuum by the use

of multi-stage steam evacuators instead of mechanical pumps, the process yields large forgings that show (1) no flakes, (2) no hydrogen embrittlement, (3) fewer and smaller inclusions.

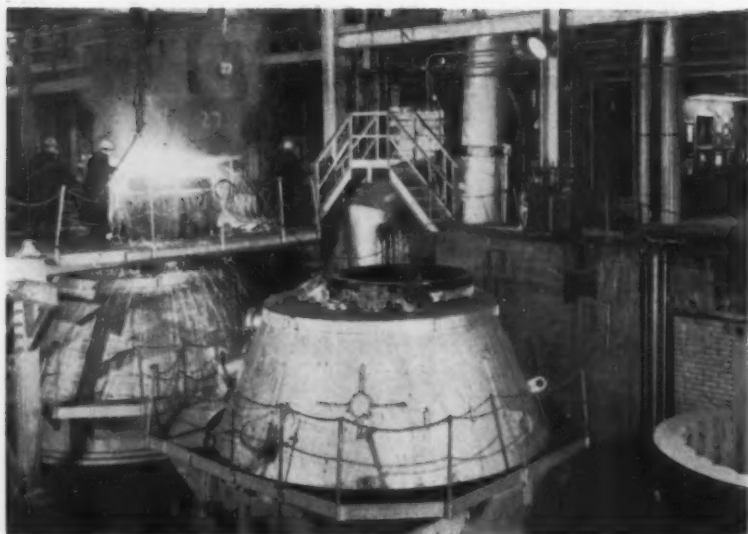
First details of the technique and its important benefits came in a paper presented at the recent meeting of the Association of Iron and Steel Engineers. Its author: E. A. Reid, Bethlehem's assistant chief metallurgist.

Eliminates Hydrogen—The main reason for melting or pouring steel in a vacuum is to reduce its gas content—particularly the hydrogen content. Hydrogen is the chief con-

tributor to the formation of flakes in heavy forged sections. And it causes embrittlement in large forged sections which cannot be cured by heat treatment.

Vacuum melting had to be ruled out for large forging ingots, Reid said. The reason: None of the current processes can produce enough molten steel at any one time to fill an ingot of the size needed.

Even vacuum pouring seemed doubtful for ingots weighing up to 250 tons, Reid explained. German steelmakers approached the problem by using a large battery of mechanical pumps to evacuate the pouring chamber. But this was "dis-



TWIN TANKS: While pouring is done at one vacuum unit, the other remains on standby, will be used while first ingot is cooling.

tasteful to Americans," he said. "Furthermore, the degree of vacuum reportedly attained . . . seemed somewhat less than that desirable."

Try Steam Jets—To sidestep these pumping problems, Bethlehem thought of using multi-stage steam jets to evacuate the pouring chamber containing the ingot mold. Plant equipment engineers, assisted by

vacuum equipment specialists from the F. J. Stokes Co., Philadelphia, designed and installed a 7-ton pilot steam evacuation unit in 1956.

When pilot tests proved successful, two 250-ton units went on the drawing boards. The first of these started production in July, 1957. The second followed in January of this year. Pouring is alternated be-

tween the two tanks, since they both use the same pumping system.

An accompanying schematic diagram shows one of the 250-ton tanks with a mold in place and a furnace ladle positioned over a pony ladle at the tank top.

The tank is made of 1½ in. thick plate with a 6-in. thick plate capping the dome. Overall height inside is just under 30 ft and the major ID is 17 ft. A 36 in. main vacuum line leads from the tank to the pumping system.

Use Cooling Water—Flanges of the main tank, dome, and pony ladle are sealed with neoprene rings which are water cooled for protection. Water also runs over the outside of the tank to keep it cool while the ingot solidifies.

Observation ports in the dome permit visual, TV, and motion picture viewing of the hot metal stream during pouring. An aluminum rupture disk seals the tank from the nozzle of the pony ladle while the tank is being pumped down.

Another schematic diagram shows the pumping system as a four stage stream jet evacuator. There is a 42 in. barometric condenser be-

Vacuum Pouring Cuts Hydrogen Content

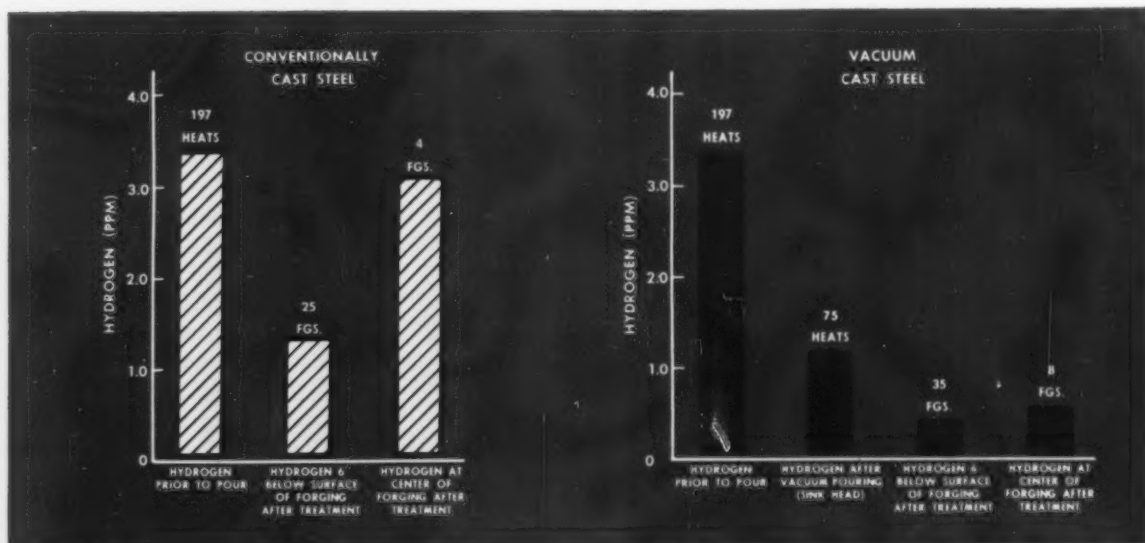


FIG. 1: Hydrogen content drops during pour, goes down more after giant forgings are heat treated.

Tensile Ductility Properties Compared

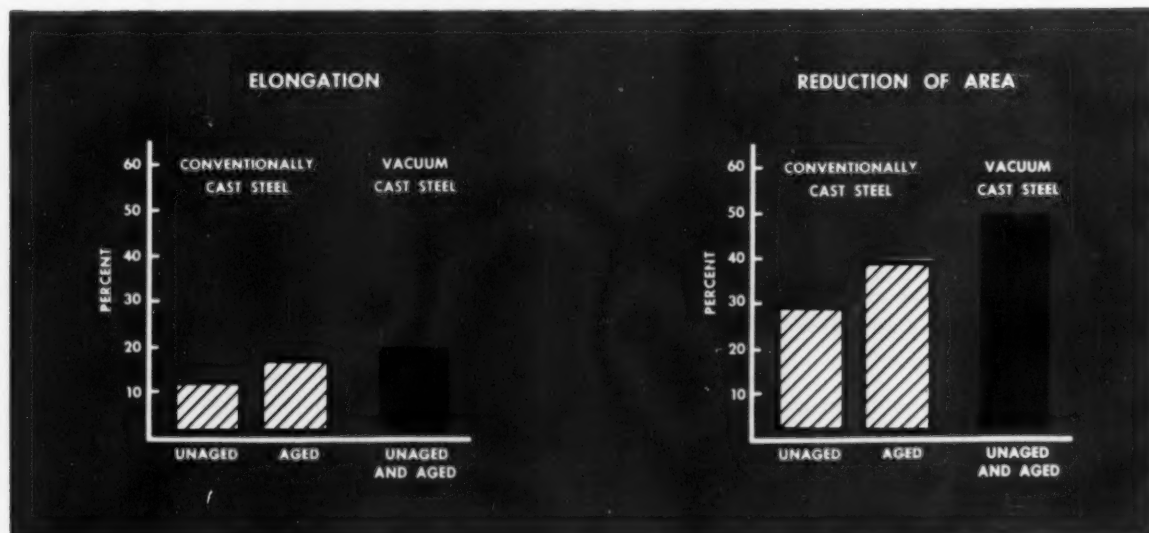


FIG. 2: Vacuum pouring boosts ductility and makes it unnecessary to age test bars to remove brittleness.

tween stages 2 and 3 and a 28 in. condenser between stages 3 and 4.

The system operates on a minimum pressure of 135 lb of 450°F steam. It can evacuate 318 lb per hour of 19.3 molecular weight gas at 212°F and an absolute pressure of 1 mm of mercury. Its ejectors work on a mass velocity principle wherein steam passing through a jet is alternately expanded and compressed, picking up gas and vapor from the vacuum line on the way through.

Careful Make-Ready — Preparations for pouring are critical. Tank, stools and vacuum lines are carefully cleaned of oxide and dust. The ingot mold is cleaned of all oxide, preheated, and placed at an exact distance below the pony ladle nozzle. The sinkhead is lined with high quality alumina brick and cement and dried thoroughly.

With everything ready, the tank is sealed and the pump started. The fourth stage starts first, followed by subsequent stages working back toward No. 1. With all stages in action, tank pressure drops below 500 microns, or less than 1/2 mm of mercury.

Steel is then tapped from the

electric furnace into the ladle above the pony ladle. When the latter is full, its stopper rod is raised and the molten metal penetrates the thin aluminum rupture disc to enter the vacuum tank.

Fan-Shaped Stream — Vacuum removal of gases causes the metal stream to fan out in a cone shape and disintegrate into droplets which fall into the mold. Bubbles of gases form and burst as they come out of solution.

When pouring is finished, the vacuum line valve is closed and the pump gradually shut down. From 100 to 200 cu ft of argon is bled into the tank to dilute combustible gases and prevent a possible explosion when air is admitted. The pony ladle then comes out so a hydrogen sample can be taken from the sinkhead. Next the pouring platform and dome are removed. While the ingot solidifies, another is poured in the second tank.

As for results, "It is quite clearly established that vacuum pouring materially reduces the hydrogen content of steel in large forgings," Reid stated. Fig. 1 shows this graphically.

Stops All Flaking — Bethlehem has dramatic proof of what less hydrogen means in terms of flake-free forgings. Some conventionally made forgings may flake even though it takes a month or more to cool them to room temperature. By contrast, a forging made from vacuum poured steel was air cooled right from the press. Destructive tests showed no flakes whatever.

Normally, forgings would not be air cooled in this way because some heat treatment is always needed to refine and homogenize the grain structure. But the experiment showed that heat treatments for maximum grain refinement may be devised without concern for flakes.

Moreover, vacuum poured steels wipe out hydrogen embrittlement as a "necessary evil" in large forgings. Fig. 2 shows the superior ductility of vacuum poured steel to conventionally cast metal, regardless of aging treatments.

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High Strength Titanium Alloy Has Good Weldability

By F. A. Crossley—Senior Metallurgist, Armour Research Foundation, Chicago

The need to develop good welds along with high strength may soon be the deciding factor in wider use of titanium.

That it won't be a limiting one is assured by this new age-hardenable alloy.

For years, researchers have been seeking a high strength titanium alloy that can be welded. While the Dept. of Defense doesn't list weldability in the objectives of its titanium alloy rolling program, present and future air weapons will require facing up to it sooner or later.

Single-phase alloys are readily weldable. But strengths even as high as 150,000 psi (0.2 pct offset yield) hasn't been achieved in this type, nor is it likely they will be. Therefore, high strength must be obtained by heat treatment.

Requires Low Alloy—In the case of heat treatable alloys, weldability requires that alloy additions be kept low. With low alloying additions the best hope of getting high strength lies in age or dispersion hardening. A new Ti-3Mo-0.25Be alloy is the first titanium-base alloy of this type to show commercial promise.

Because of low alloy content, it offers greater promise for producibility to close dimensional tolerances in very large sheets than present alloys of the same strength level.

Data on the new alloy were obtained for a 10-lb ingot made from 100 Bhn sponge by double arc melting. Analysis of the ingot was 2.7 pct Mo, 0.24 pct Be, 0.025 pct C, 0.0025 pct H, 0.005 pct N and 0.069 pct O. All tests were on 0.045 in. thick sheet.

Readily Formable—Fig. 1 shows hardness as a function of solution quenching temperature. Minimum hardness occurs at 1400°F. Therefore, maximum formability should result in material quenched from this temperature. For solution treatment temperatures above 1400°F, hardness rises rapidly. Presumably this is due to increasing amounts of beta transforming to omega during the quench and decreasing amounts of the soft alpha phase.

General hardness level of aged specimens depends on solution tem-

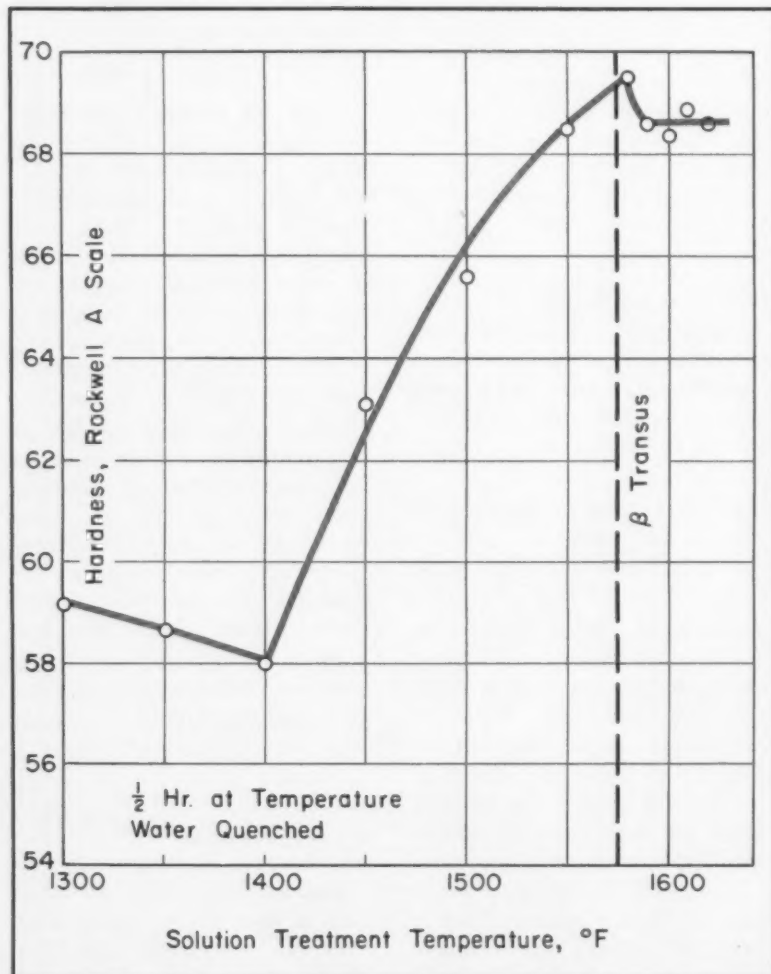


FIG. 1: Hardness plotted against solution treatment temperature shows maximum formability occurs in material quenched from 1400°F.

perature. The hardness level decreases with decreasing solution temperature. Apparently alpha is not hardened much by aging. Solution treating at 1400°F produces a microstructure containing roughly equal amounts of alpha and retained beta.

Fig. 2 shows hardness versus aging time for specimens solution treated ½ hour at 1500°F and water quenched. Hardness of 70 Ra corresponds to about 400 DPH, and tensile strength in the neighborhood of 170,000 to 180,000 psi. The data indicate that aging should be done in the range of 800° to 900°F. Specimens air cooled (in glass bulbs) from solution treatment could not be age hardened above a hardness of 48 Ra.

Apparent Structure—In a specimen solution treated at 1550°F for ½ hour and water quenched, the structure apparently consists of alpha with a fine precipitate (assumed to be TiBe), alpha prime, and some retained beta. Also, omega is probably present.

Upon aging at 800°F the precipitate in the alpha phase coarsens, and TiBe apparently precipitates from the alpha prime-beta areas. Subsequently, the conventional alpha rejection aging reaction occurs in the alpha prime-beta areas.

As expected from data in Fig. 1, bend ductility increases with decreasing solution treatment temperature for water-quenched specimens. Specimens air cooled (in bulbs) show higher bend ductility than specimens water quenched from the same temperature. However, air cooled material can't be age hardened to the desired strength level.

Generally, a sheet material should have bend-radius-to-thickness ratios between 2 and 3 in laboratory tests. The better bend ductility which can be obtained with lower solution treating temperatures may be applied in some uses which don't require maximum strength at low temperatures.

Supports Hardness Data—Tensile test results are summarized in Table

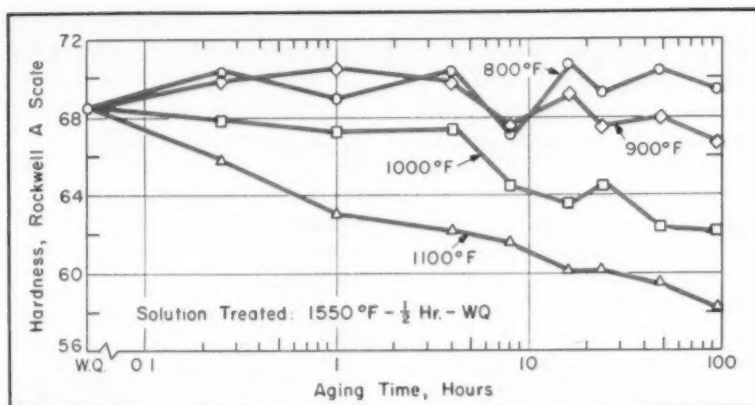


FIG. 2: Plot of hardness vs aging time indicates aging should be done in the range of 800-900°F.

I. The following points indicated by hardness data are supported by the tensiles: For a given aging treatment, strength increases with increasing solution treating temperature. For a given aging treatment and a given solution treatment temperature, strength decreases with increasing solution treatment time.

Overaging occurs in 1 hour at 1000°F. Solution treating at 1400°F produces a very low strength, highly ductile condition which is not strengthened by aging.

Elongation values were very low compared to some reduction-of-area values. This is believed due to the presence of surface contami-

Table I | Room Temperature Tensile Strength

Heat Treatment*	Ultimate Tensile Strength, 1000 psi	Yield Strength (0.2 pct offset), 1000 psi	Elongation in 1 in., pct	Reduction of area, pct	Fracture Stress 1000 psi
1550 °F, 2/3 hr	150	129	5.0	21	187
1550 °F, 2/3 hr;	171	155	1.6	9	188
900 °F, 2 hr	182	154	1.6	17	
1550 °F, 2/3 hr;	163	153	1.0	18	199
800 °F, 16 hr	162	147	1.6	5	170
1550 °F, 1/2 hr;	151	142	4.0	36	243
800 °F, 8 hr					
1550 °F, 1/2 hr;	130	127	6.0	38	190
1000 °F, 1 hr					
1150 °F, 1/2 hr;	172	166	2.0	9	184
900 °F, 4 hr	148	140	2.5	20	164
	139	135	5.0	41	230
1550 °F, 1/4 hr;	171	156	2.5	25	210
800 °F, 16 hr	177	161	2.4	25	232
1475 °F, 1/4 hr;	140	136	3.7	45	218
800 °F, 16 hr	138	136	4.0	38	200
1400 °F, 1/2 hr	114	93	12.0	40	159
800 °F, 16 hr					

* In all cases followed by water quench.

nation as indicated by an alpha case of 0.001 in. depth. With enough surface material removed to eliminate the alpha case, tensile elongation values would be expected to be more in line with the generally good reduction-of-area values.

The best tensile properties were obtained for specimens heated at 1550°F for ¼ hour and water quenched, and those given 800°F for 16 hours and a water quench. Average properties for two specimens were 174,000 psi ultimate tensile strength, 158,000 psi yield strength, 2.5 pct elongation, and 25 pct reduction of area.

Tensile test data for fusion-welded specimens are given in Table II. Specimens were solution treated at 1550°F prior to welding. They were tested after welding and after a postweld aging treatment of 800°F for 16 hours. All specimens were cut longitudinal to the rolling direction.

Transverse Welds — All transversely welded specimens fractured in the heat-affected zone. Such a specimen exhibited a 146,000 psi yield strength, 1.6 pct elongation and 13 pct reduction of area in the as-welded condition.

After aging, transversely welded specimens fractured at 140,000 psi without yielding, indicating that the aging treatment was not sufficient for the all-transformed beta structure of the heat-affected zone and the weld metal. It is expected that a higher aging temperature would improve ductility while maintaining high strength.

Longitudinal Welds—Specimens with longitudinal welds were much lower in strength and higher in ductility than those with transverse welds, both as welded and as post-welded aged. In these longitudinally welded specimens the reduced section was entirely weld metal.

The lower strength is believed due to the fact that the volume of weld metal per unit volume of material was three times larger for the longitudinally welded specimens. This resulted in slower cooling of these specimens and overaging of the weld metal. In practice, the volume of weld metal to volume of material ratio would be more like that of the transversely welded specimens. Thus, the weld zone could probably be aged up to the same strength as the parent metal.

Only two tests were made on spot welded material—a single cross-

tension test and a single tension-shear test. Specimens were post-weld aged at 800°F for 16 hours before testing. The results indicate favorable spot welding characteristics. The cross-tension value was 450 lb and the tension-shear value was 1420 lb, giving a ratio of the latter of 0.32. A higher aging temperature or longer time at 800°F should produce higher values.

Good Creep Resistance—Creep data for the heat treated Ti-3Mo-0.25Be alloy were compared with Ti-6Al-4V alloy in the annealed (1300°F for 2 hours) condition. For a given creep strain and time the Ti-3Mo-0.25Be alloy has 80 to 85 pct of the strength of the Ti-6Al-4V alloy, despite its low alloy content. Since creep data for the Ti-6Al-4V were obtained with bar specimens and those for the Ti-3Mo-0.25Be alloy with sheet specimens, it is very likely that the latter is better than this comparison indicates.

A specimen consisting of weld metal of low tensile strength showed creep resistance at 35,000 psi about equal to an unwelded heat treated specimen. However, a similar weld metal specimen ruptured in 58 hours under a stress of 60,000 psi, reflecting the lower short-time strength.

Creep specimens which did not rupture during exposure were tensile tested at room temperature. The high strength specimens showed loss of both strength and ductility. The average yield strength after exposure of three specimens was 135,000 psi, compared to 154,000 psi for unexposed specimens. A low strength specimen consisting of weld metal showed no significant changes in tensile properties as a result of creep exposure.

More Work Ahead — All these findings stem from a limited number of specimens under very limited conditions. No work has been done to determine the rolling temperature for obtaining optimum response to heat treatment. Also, solution treatment above the beta transus should be investigated.

Table II | Strength of Fusion-Welded Samples*

Heat Treatment	Welding Directions**	Ultimate Tensile Strength, 1000 psi	Yield Strength 0.2 pct offset 1000 psi	Elong. in 1 in., pct	Reduction of Area, pct
1550 °F for ½ hr, water quenched, welded	T	152	146	2	13
	L	113	103	2	6
	L	121	112	2	13
1550 °F for ½ hr, water quenched, welded, 800 °F for 16 hr	T	145	—	0	0
	T	133	—	0	0
	L	115	100	4	13
	L	112	97	3	16
	L	107	105	2	13
	L	118	109	3	13

* Tensile data taken at room temperature.

** All specimens were longitudinal with respect to rolling direction; L = weld lengthwise to specimen, T = weld transverse to specimen.

Adjustable Die Speeds Tooling

A new device gives press tooling greater flexibility.

It's a low-cost setup that permits reuse of basic sections from job to job.

▪ A newly patented method of die construction permits reuse of the base and female die portion despite part changes or redesign. Further, its inventor claims it can save a quarter to a third in lead time.

Since dies are hand tailored starting with a block of expensive tool steel, they've had to be scrapped when any substantial changes or part redesign occur. Even minor alterations or repairs become costly and time-consuming.

Standardize Die Parts—Using a different approach, A. R. Rivera & Sons Tool and Die Co., Detroit, standardizes sections of the female die. Instead of custom building by machining and hand finishing from solid tool steel, the firm builds the die up in pieces.

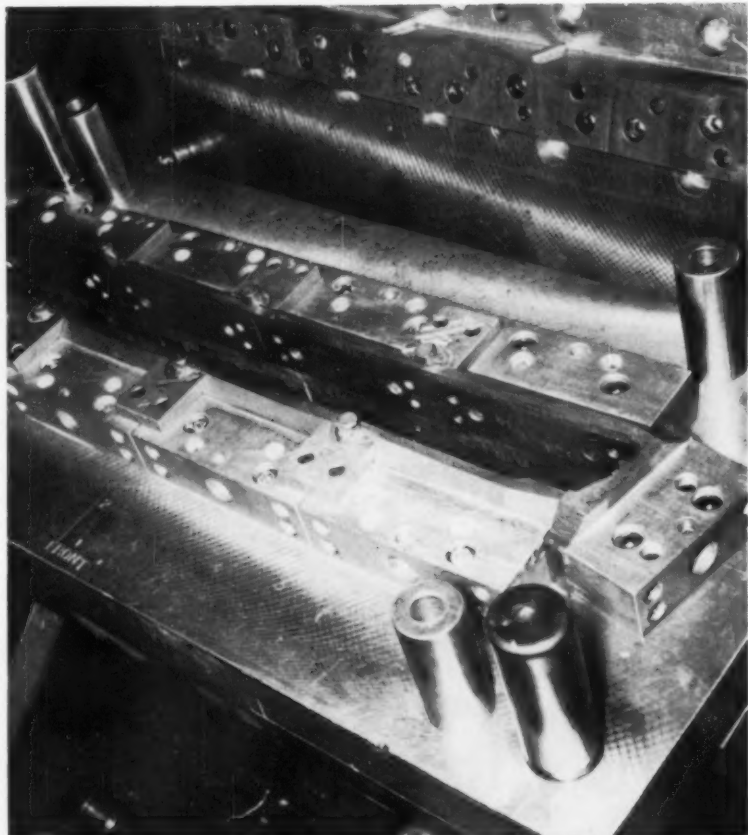
Two standard sections of steel are mounted in the general contour desired on the base. Then a tool steel blade or cutting edge is fastened to this mount.

The mounting method plays an important part. The blade must be completely rigid, yet adjustable to allow for small variations.

Making Adjustments—The answer is in a device built in the standard mounting sections. It acts like a vernier through a small gear and is adjusted by a socket wrench. With the mount tightened down, the whole unit with blade section is locked rigidly in place.

Adjustments up to $\frac{1}{8}$ in. in cutting edge location are simple. You merely loosen the mount section, wrench the blade in or out as desired and tighten.

It's also easy to repair, resharpen or otherwise service the die. With



SECTIONS COMBINE: With built-up mounts and stainless blades, die set blanks 24-gage stainless parts. Wrench adjusts blade location.

the $\frac{1}{8}$ in. allowance you can grind out nicks that would require major repairs on a conventional die.

Proved Out—Several dies are already in use at various plants. One, a flanging die doing the job of three, represents a savings in initial investment of over 66 pct. The one die handles all thicknesses of metal from $\frac{1}{32}$ to $\frac{1}{8}$ in. for a particular part.

Downtime formerly required to tear down and set up the three dies in the press is eliminated. Adjustments to the new die are all made right in the press.

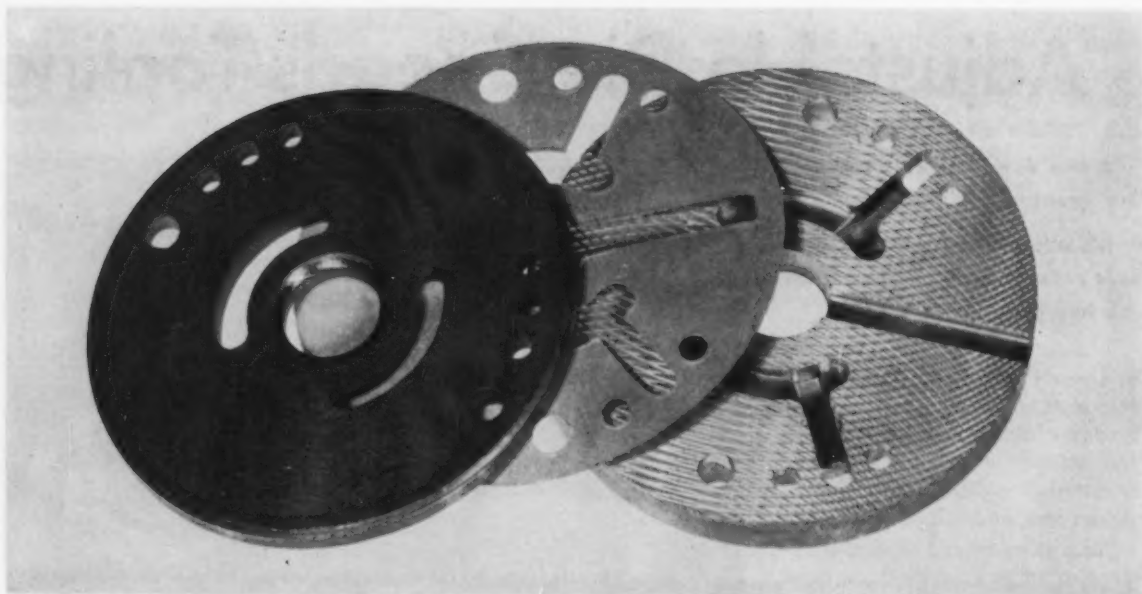
In another case, a two-stage blanking die saves 14 pct over the conventional type. The die turns

out stampings at rate of 3400 pieces per hour.

Production downtime for resharpening is reduced by at least 50 pct. By compensating for amount ground off in resharpening, the adjustment feature eliminates resetting of the die.

Permanent Value—Since the user can continue to modify this fixture-type die for future production, its value is set at \$800 when the production run is finished, rather than scrap value of \$28 for custom dies.

The diemaking firm plans to produce the mount sections in a series of standard sizes. When an order comes in, it will be filled from proper size mounts on the shelf to further reduce die-build time.



END PLATE PARTS: Components consist of a powdered iron disk (left) which resists wear; an aluminum die casting (right) which reduces overall assembly weight; a die-cut adhesive (center) to bond them.

Die-Cut Adhesive Film Bonds Iron to Aluminum

Adhesive bonding materials are taking on new forms, new properties, new jobs.

To point up the trend, here's how a die-cut film was used to join dissimilar metals.

■ Stumped by an assembly problem? Maybe you could use some of the newer adhesive bonding techniques. They're getting more popular all the time, having proved they can make strong bonds in certain aircraft and missile assemblies.

For specific uses, there are plenty of adhesives to choose from. Pre-mixed film types that you can use without mess or waste are of special interest. They insure bonds of uniform thickness, present no solvent-drying hazards, and they don't shrink in storage.

One of these film adhesives helped solve a knotty design and production problem for the Albertson Co., Sioux City, Ia., a maker of pneumatic tool motors.

How To Make It?—The part in question was a rotor end plate. It had to be light in weight and still have one wear-resistant face to handle the thrust of the high speed rotor. It also had to be an easy, low-cost item to make.

Design engineers finally decided to make it an assembly: a powdered iron disk joined to a die cast aluminum plate. The aluminum would cut down weight; the iron disk would resist rotor wear.

For bonding the two pieces, engineers chose a high strength, thermosetting film adhesive. It's a nitride phenolic developed by Min-

nesota Mining & Mfg. Co.'s Adhesives Div., Detroit.

Keeps Cost Low—For a cost of 1.7 cents per assembly, the adhesive is well suited to Albertson's output of some 35,000 rotor end plates each year. Its accelerator (catalyst) is built-in, and the sheet film die-cuts readily to match various holes and channels in the end-plate parts.

There's no doubt about joints staying put. Room temperature shear strength of the film ranges from 2800 to 3500 psi, and its peel strength is 168 lb per inch of film width. When destructive force is applied to the assembly, the powdered metal disk fails before the bond does.

Other qualities of the film adhesive include good flexibility and resistance to salt spray, high humidity, and oil.



ASSEMBLY IS EASY: First step is to place the aluminum die casting (milled face up) on locating pins.

Then the die-cut piece of adhesive is pressed in place. The powdered iron disk goes on last.



BATCH HANDLING: For convenience, 15 rotor end-plate assemblies are loaded on these center-rod fixtures.



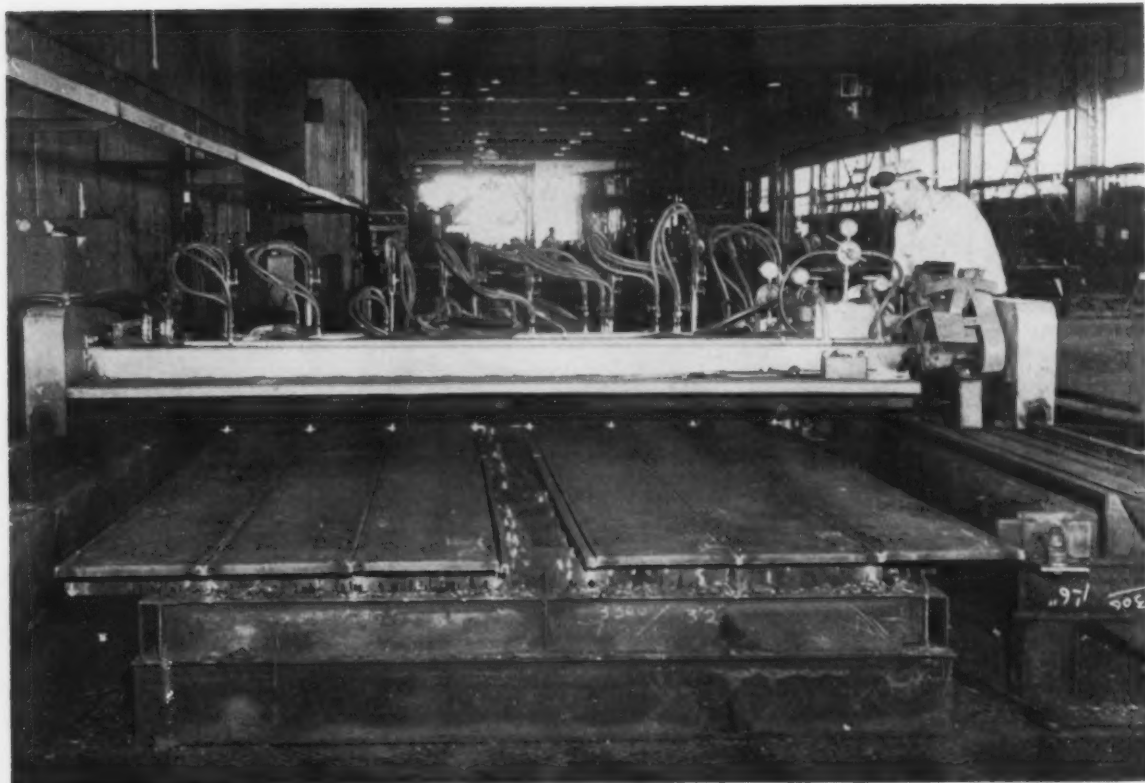
PRESSURE FIRMS BOND: Nut is tightened until bonding pressure is 35 psi. Oven curing is at 350°F.

Simple Assembly—To assemble an end plate, a worker first places an aluminum casting over two locating pins, then lays a die-cut piece of film on the milled face of the casting. He guides the powdered iron disk onto the adhesive film,

over the same pair of locating pins. About 15 of these assemblies are then loaded on a rack by sliding them down over a long rod. The rod end that projects above the top-most assembly is threaded. Tightening a nut on this end clamps the

stack of assemblies under a bonding pressure of 35 psi.

After curing and air cooling, the edges of each diecast part are machined, and the face of each powdered iron disk is lapped. Dipping in an oil bath is the final step.



MULTIPLE CUTTING: Torches strip flange plates into separate flanges. All layout lines are set before cutting.

Production Line Steps Up Girder Welding

By **J. V. Banks**—Production Manager, Kaiser Steel Corp., Montebello, Calif.

New methods to speed bridge fabricating are helping meet demand of highway expansion.

Massive girders fit in well with tight schedules.

■ Building huge bridge girders on a production line basis requires the courage to break away from old methods. Kaiser's Montebello plant has done this to set up handling and welding steps for high output.

The setup features a giant squeezing fixture to fit flanges to

webs and position assemblies for welding. Various thicknesses of flange plates are assembled end to end for the total span required and in a width that will yield several flanges.

Proper alignment is insured with stops against which the material can be quickly positioned. Multiple burning torches are then used to trim ends of abutting sections and bevel for welding.

Use Submerged Arc — With plates butted together, the first side is welded with automatic submerged

arc-welding. After finish grinding, the plates are turned, arc scarfed and ground to bright, sound material. After the welds on the reverse side are completed, the web side is turned face up.

All layout lines for the girder are put on the flanges with templates. Since each flange plate will produce several flanges, this saves on layout time.

The flange plates, in lengths up to 130 ft are then moved to the stripping table using two overhead cranes and spreader bars. Special

techniques maintain straightness during stripping.

Grind and Shotblast — At the next station, the edges are slightly chamfered with a grinding wheel. Centers are shotblasted to insure a clean surface for welding.

Web plates are similarly butt-welded and moved to the stripping table. Here an adjustable cambering bar controls the torches during cut of full-length camber.

Trimmed webs are then moved into the next station and the edges shotblasted. Shotblasting of both webs and flanges is accomplished by a unit suspended from a light jib crane.

Squeeze Insures Fit—Webs and flanges are then positioned in the girder assembly fixture while in the flat position. This pneumatic fixture provides a squeeze of $4\frac{1}{2}$ tons per lineal foot of girder.

While insuring a tight fit between flanges and webs, it holds flanges perpendicular. The fixture adjusts to take any size girder up to 11 ft deep by 135 ft long.

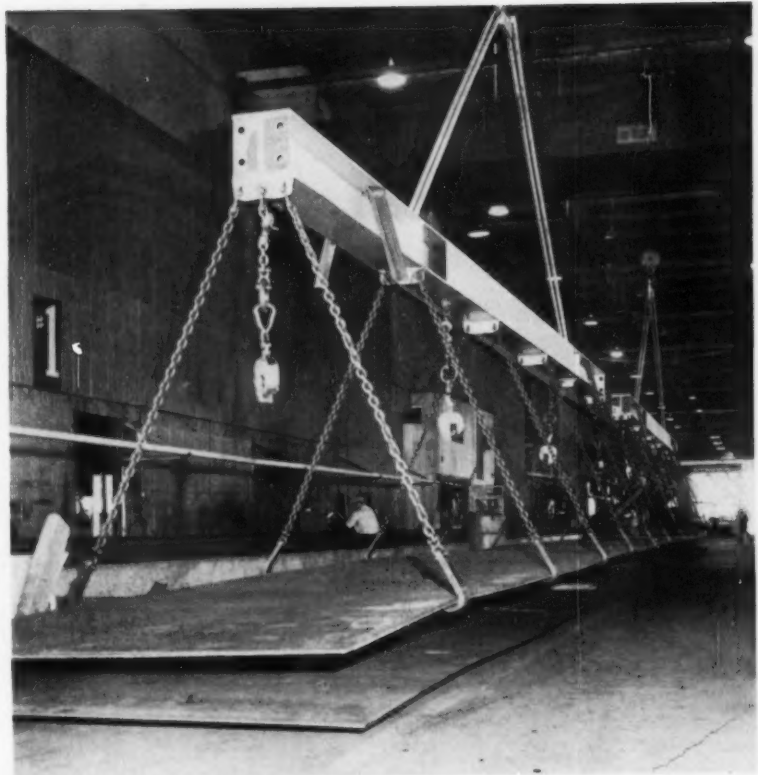
Built in three sections of 60, 45 and 30 ft, it can be either used independently or bolted together as a single unit. Pressure, applied equally on both sides, forces each flange to the camber of the web.

Raises at Angle—After clamping, pivot pins are removed from one side of the fixture. Hydraulic jacks operating under the center raise the fixture and girder to a 45° position for welding.

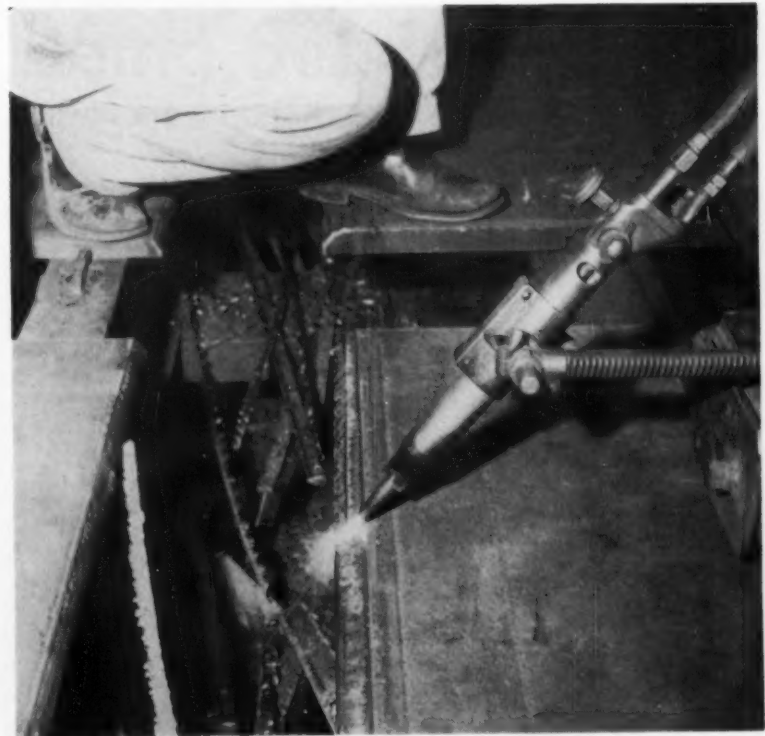
A tandem-arc welding machine employs 900 amps dc on the lead wire and 800 amps ac on the trailing wire. It's mounted on a tractor-type carriage running in the web of the girder.

The unit deposits $5/16$ -in. fillet welds at 45 ipm. A travelling wall jib carries the power cables and an automatic flux recovery unit.

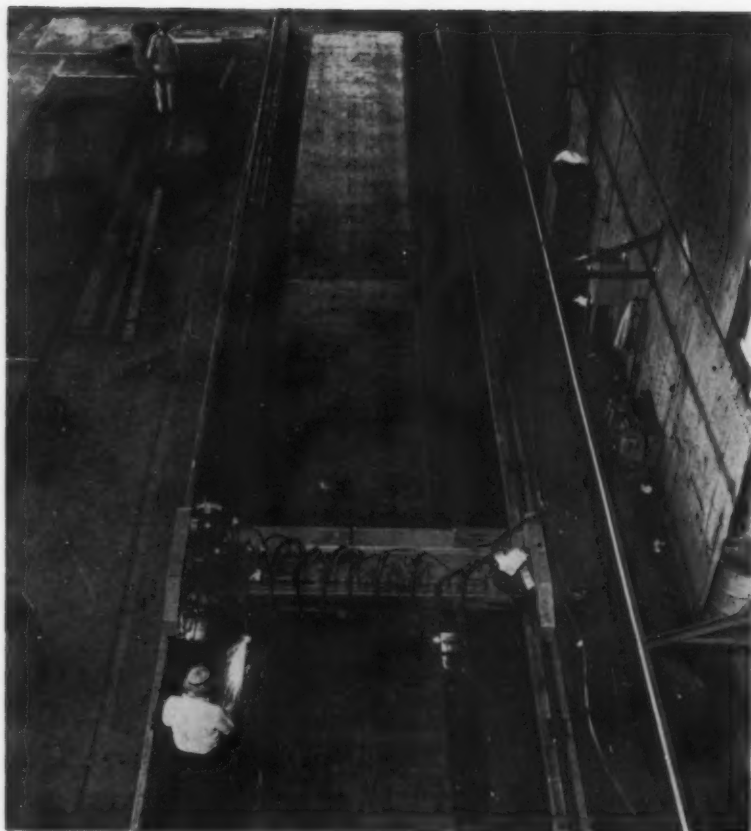
Reverse Pins—After making one full-length weld, the fixture is lowered. Hinge pins are put in on the opposite side and removed from the first side.



HOW TO MOVE LONG ONES: Two spreader bars, each suspended from an overhead crane, carry plates up to 135 ft long to stripping table.



PREPARING SPLICE: Flame torch bevels abutting sections. Plates are welded end to end for total span required.



CAMBER FOR WEBS: Adjustable cambering bar controls torches in cut of full-length camber.



EASY HANDLING: Assembly fixture tilts to welding position. Tractor-type carriage holds tandem-arc unit in the web of the girder.

The fixture is then raised to welding position for the other flange weld. During this movement the welding unit is suspended from the wall jib.

Special hooks, provided for the spreaders, handle the long plates. These hooks are now used to remove the girder assembly from the fixture and reposition on the floor at a 45° angle for completing the welds on the back side. Welding at this station is similar to that just described except that alternating current is used for both wires.

Weld Stiffeners—With all longitudinal welds complete, the girder is positioned at the next station with the side having the most stiffeners facing up. The stiffeners and all other detail for this side are then fitted and welded.

With the girder on edge and the bottom flange up, seal welds between stiffeners and top flange are made. A portable high-speed unit mills bearing areas square.

Holes for rockers and shoes are drilled at this station. The girder is then turned to an upright position to complete downhand welding of detail and bearing plates and the driving of stud-type shear connectors. An inspection station provides inspection and repair of defects noted.

Prepare Field Splice—For girders requiring a field splice, the two mating pieces are laid flat on a level series of beams with fixed stops. With the two pieces about 8 in. of each other at the weld splice, the final trim for the splice is made and edges prepared for field welds. A spot check on accuracy is the bringing of the two pieces solidly together as will be done subsequently in the field.

To keep production going smoothly Kaiser must closely schedule and control field erection. Field crews keep in constant touch with progress of piers and abutments at job sites. Flexible shop schedules insure constant delivery flow.



OFF THE SHELF: Typical standard fasteners now available for high temperature service include (l. to r.)

two made of Type 431 stainless, three of Vascojet 1000, one of 17-4 PH and two of Thermold J.

Are Missile Fastener Specs Being Set Too High?

By H. G. Brilmyer—Vice President, Research, Huck Mfg. Co., Detroit

Fasteners can create costly bottlenecks in crash missile programs.

Before going down the line with the matched materials concept, see if standard types won't do just as well.

Progress in missile fastener materials hasn't always been able to keep up with the advances in structures, power plants and fuels. Perhaps this is because metallurgy is a more exact science and doesn't lend itself as well to crash-type programs. Where metallurgy lags, it must be by-passed; and deciding how best to by-pass it is a big problem.

The tendency has been to pick

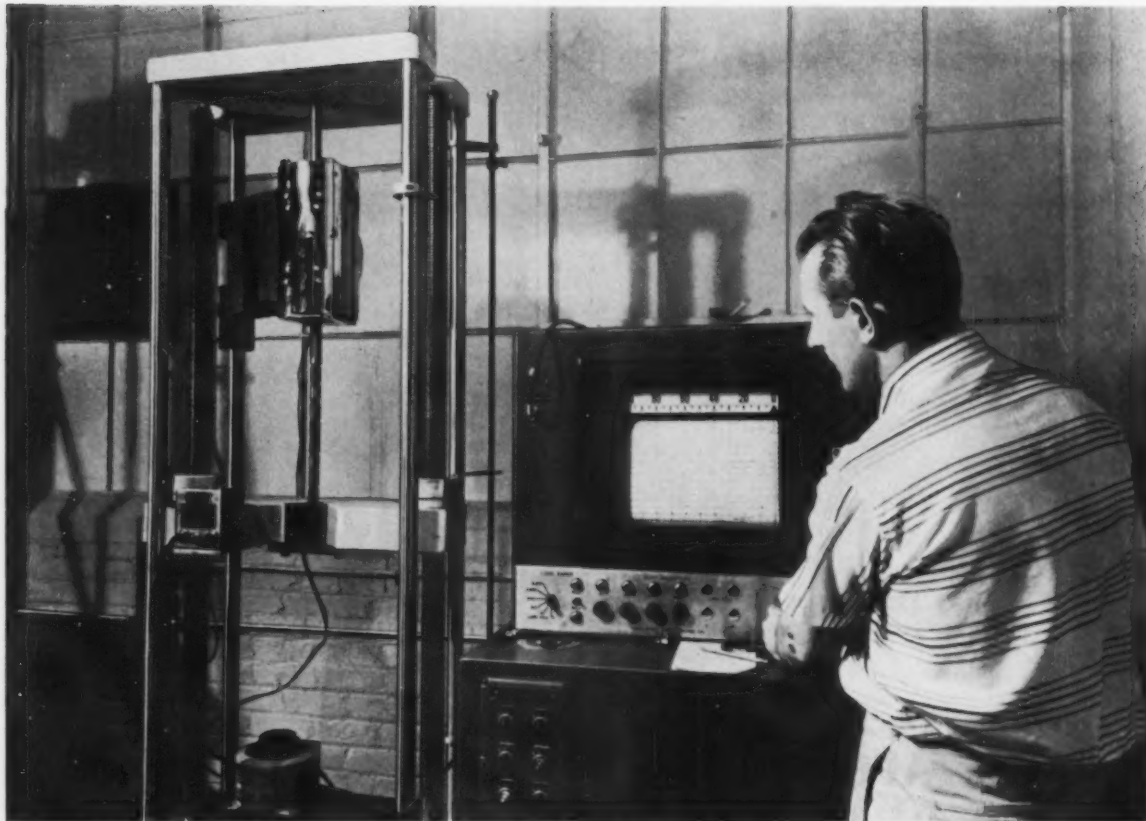
the very best high temperature-strength material available and hang the cost. Recent research indicates, however, that much more may be done with standard fastener materials than has heretofore been possible. Stock fasteners could bring about big savings in time and money.

Effect of temperature on a material's physical and mechanical properties is probably the most important factor in choosing fasteners for airborne vehicles. The designer must expect skin wall temperatures up to 1000°F for high-speed aircraft, to 2000°F for short-range missiles, to 4000°F for medium-range missiles and even higher for the big ICBMs.

Easy But Expensive—The simplest solution is to match materials; that is, use the same material for the fastener as is used for the structure. If beryllium is being used as a sheet material, beryllium fasteners are specified. The theory behind this approach is that the fastener will react in the same way as the sheet material.

From a practical point of view, there are two flaws in this kind of thinking. First, beryllium is more expensive than standard alloy steel. Second, beryllium is not easily headable or readily formed with fastener-making equipment.

Whether or not an alloy steel will do the job can't be decided with any rule of thumb. Missiles are critical



PROVES ADEQUATE: Standard cadmium-plated AISI 4037 alloy steel fastener, mounted in beryllium sheet specimens, performed well in high temperature tests. Only drawback was cadmium loss beyond 400°F.

structures. Each assembly must be considered separately, taking into account such factors as its function, expected temperatures, known stress and required life.

Cheaper Solutions — Fastener manufacturers can help get the answers by running tests that simulate the extreme service conditions. In one such high-temperature test of Huck fasteners, for example, standard cadmium-plated AISI 4037 alloy steel fasteners installed in beryllium specimens gave more than adequate performance up to 1000°F. The only drawback was loss of the cadmium protection beyond 400°F.

If this structure was part of a one-shot, expendable missile, cadmium loss wouldn't be a problem. If corrosion resistance is a necessary part of the specification, however, diffused cadmium-nickel plat-

ing can be used; it protects steel at temperatures up to 900°F.

There's also a trend toward use of die steels such as Thermold J and Vascojet 1000. Fasteners made from these materials are heat treated and drawn at about 1000°F. They develop shear strengths at 900°F that were until recently considered excellent room temperature properties for conventional alloy steels.

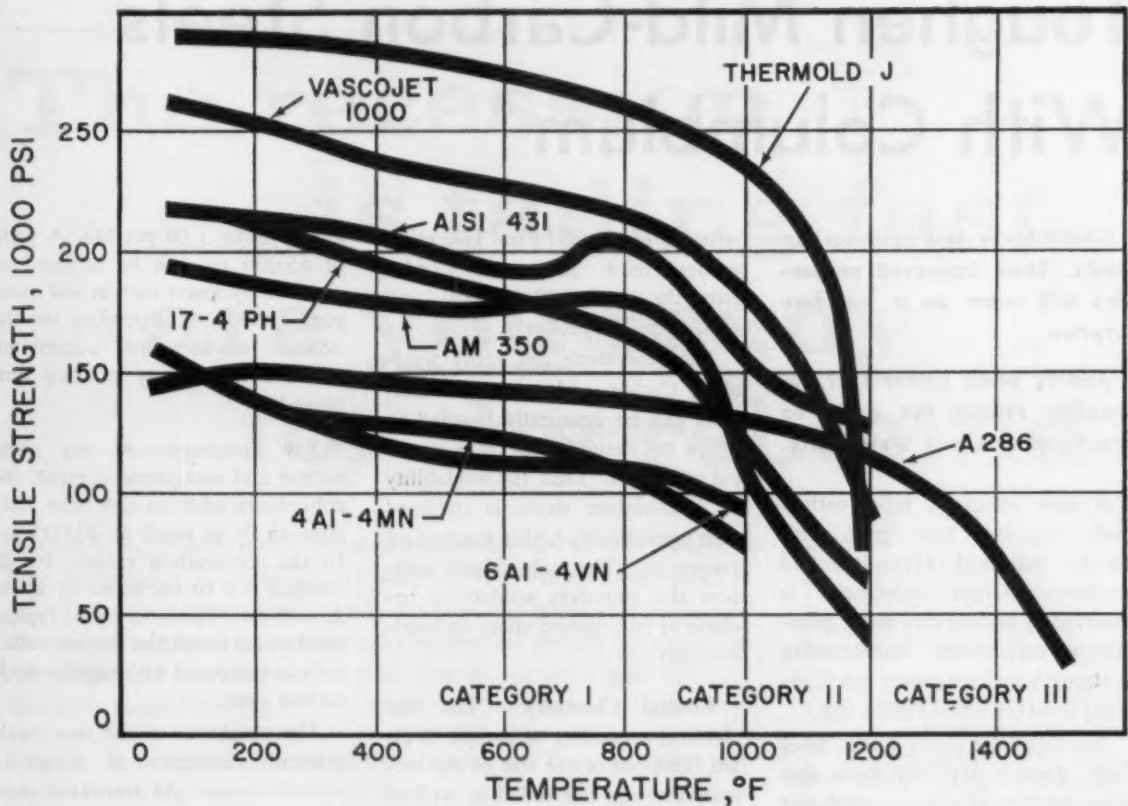
No Forming Problems—The die steels are headable and readily formed with present equipment. While they aren't corrosion resistant, diffused cadmium-nickel plate provides protection up to 900°F.

AISI 4037 fasteners are heat treated and drawn at 825°F. They retain most of their room temperature properties up to the draw temperature. Beyond this point they begin to lose strength—gradually

at first, then faster as temperature increases. But time at temperature above 800°F may be very short in a short- or medium-range missile. Enough strength may be retained in the fastener to fill the short duration high-temperature requirements.

So it appears that the many factors work not only to create problems for the missile designer, but to help solve them as well. Increases in speed bring about higher temperature, which lowers strength. But the increase in speed also shortens the time at temperature.

Cooler Inside — Temperature gradient is another important factor that might be overlooked in the tendency to over-design and make the missile super-safe. There's a definite heat gradient from the outer skin to the geometric center of the missile. Temperatures near the center are much lower than at the skin.



HOLD UP WELL: Compared after 30 minutes exposure at various temperatures, alloy steels A-286 and

AISI 431 do a good job of retaining strength beyond 1000°F; die steels fall off sharply at this point.

Fasteners used in some locations, then, need not have high-temperature strengths equal to those of the skin. This is especially true in manned vehicles; there will be little temperature effect on fasteners used in the cockpit or cabin area because it has to be air conditioned.

Fastener applications that involve really high-temperature service have been on weapons which don't come back. With no evidence to examine, conclusions as to structural anemia or over-designing are sheer conjecture.

In such a situation, with no evidence on hand to confirm or refute design decisions, the designer must really lay his integrity on the line. He is tempted constantly to play safe and pay a terrific cost penalty by matching fastener material with material being joined.

Time to Change—The practice

of matching materials can survive, however, only as long as the national economy will sustain it. The time has come to learn more about the capabilities of readily available materials for fasteners subjected to high temperatures for extremely short periods of time.

A program of this kind could lead to a realistic downgrading of fastener material requirements for high-temperature but short-time exposure conditions. Such a program could demonstrate the feasibility of using alloy steel fasteners at temperatures up to 900°F and many austenitic stainless steels at temperatures in excess of 1200°F.

Need More Data—Despite the obvious economy of using fasteners of readily available materials, it may be some time before any trend is established. Each design decision must be based on test data, and tests

take time. Some testing has been completed with encouraging results.

We are now aiming at not just the speed of sound, but three times, four times the speed of sound. Each new Mach number presents a new hurdle. Each time our technology takes us over the hurdle, we are challenged with new problems. The program never stops; it continues to demand more and more of everyone concerned.

Despite the urgent character of a weapons program, the designer cannot afford to settle for the simple matched materials solution, except as an emergency measure. He must investigate the possibility of downgrading his fastener material specifications. The way things stand now, we couldn't afford to get involved in a large-scale shooting war; there just isn't enough exotic material to go around.

Toughen Mild-Carbon Steels With Columbium

Check these new mild carbon steels. Their improved properties will come as a welcome surprise.

Adding small amounts of columbium refines the grain to boost strength and weldability.

A new series of mild-carbon steels combines finer grain with greatly improved strength and toughness. Grain refinement is achieved by adding very small quantities of columbium. Improvement in strength and toughness result directly from the refined grain size.

Developed by Great Lakes Steel Corp., Detroit, the new steels also claim substantial gains in notch-bar toughness. Even at improved strength levels, their ductility (as measured by elongation or reduction in area) is only slightly affected.

Easily Welded—Classified according to yield strength, the steels are designated GLX-45-W, 50-W, 55-W, and 60-W. For example, GLX-45-W indicates a mild-carbon steel with a minimum yield

strength of 45,000 psi. The other grades have minimum yield strengths of 50,000, 55,000, and 60,000 psi respectively.

The new steels are easily weldable. Carbon and manganese contents can be drastically lowered to attain the desired level of mechanical properties. Thus, the weldability of mild-carbon steels is obtained with considerably higher mechanical properties. The columbium addition also improves weldability because of its negative effect on hardenability.

Control Chemistry—The mechanical properties of carbon steels are functions of the size of the sections that are hot rolled as well as of the carbon and manganese contents. For fixed minimum mechanical properties, a balance between carbon and manganese must be maintained. Minimum chemical composition will be higher as the thicknesses rolled become heavier.

Generally, to obtain yield strengths much above 40,000 psi, carbon and manganese content must be high. The new steels achieve high yields with about 0.18 pct

C and under 1.00 pct Mn. A yield of 45,000 psi can be attained at successively lower carbon and manganese contents, depending on the amount of contained columbium and the hot rolling practice employed.

For Toughness—At any given carbon and manganese content, the columbium addition can raise yield strength by as much as 20,000 psi. In the mild-carbon ranges, tensile strength can be increased by about 15,000 psi. The table shows typical mechanical properties for hot-rolled coils as compared with regular mild-carbon steel.

The toughness of the new steels generally increases at higher strength levels. As transition temperature is lowered, strength tends to increase. Impact tests indicate considerably improved toughness at low temperatures (-20° and -40° F.) Hardenability drops off with increasing columbium. This is beneficial in burning or welding.

Best Results—The columbium addition also reduces susceptibility to underbead cracking. Weldments on light plate have shown no underbead cracks even when welded at -40° F. Best results are obtained with electrodes at the same carbon grade, except that the class used should over-match the parent metal in strength. For multipass welds, electrodes of the AWS 7000 class are satisfactory.

In forming, the new steels will have increased springback because of their higher strength. For plate up to $\frac{1}{2}$ in. thick, bending radii must not be less than the plate thickness for GLX-45-W. For GLX-60-W, radii of twice the plate thickness are recommended.

Mechanical Properties

(Hot-rolled coils: 0.325-in. thick x 74 in. wide). Ladle Analysis, pct: C - 0.25 - Mn - 1.05 - Si - 0.05

	Regular Steel	GLX-50-W	GLX-55-W	GLX-60-W
Yield Strength (0.2 pct), psi	41,350	53,330	56,220	62,750
Tensile Strength, psi	74,090	82,830	86,400	87,970
Elongation in 2 in., pct*	43	40	40	37
Hardness, Bhn	150	170	175	180

* $\frac{1}{2}$ in. wide tensile specimen.

A word to the refractory-wise:

The recession is fading fast... are you ready for the rebound?

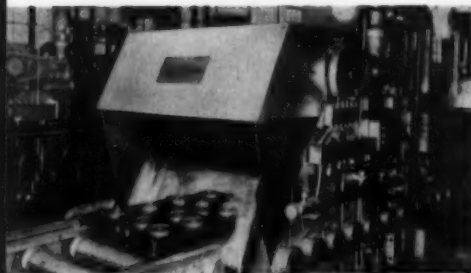
Industry is on the move again. But management has learned valuable lessons from the recession. In the future they will exercise extremely *close* control of costs. To satisfy this sharp-eyed attitude, unit costs and prices must be brought down to a rock-bottom low. So make sure *your furnaces* can help cut production costs. Make sure your furnaces are ready *now* to operate at peak efficiency during the months to come.

Consider the "vulnerable" areas in your furnace, for example — areas subjected to flame impingement or heavy loads, or exposed to abrasion or corrosion. Or other working areas where heat must pass *through* the refractory. These are the areas where you can substantially cut production costs — particularly if you use one of our special-purpose Super Refractory materials. The three examples on this page show how *large* these savings can be.

HERE'S HOW YOU CAN START CUTTING COSTS:



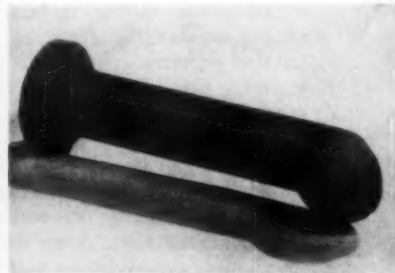
It will take less than an hour to read these two booklets about the applications — and properties — of Carborundum's unique, new super refractories. Send for them today, to Refractories Div., Carborundum Company, Perth Amboy, N. J., Dept. B-108 B.



LAST 5 TIMES AS LONG. In this high temperature atmosphere furnace, parts travel through on a cycle from cold to 2100°F to cold in 1 hour and 10 minutes. Metal fixtures warped, stuck to parts. Thicker fixtures absorbed furnace heat. Super Refractory fixtures outlasted the alloy 5 to 1, cut weight, ended sticking, and cost less as well.



STOP ALL MAINTENANCE FOR 2 YEARS. Notches in this walking beam furnace lasted 4 to 6 months, and furnace had to be shut down almost weekly for repair on the notches (on which bars being heated rest). When Super Refractory rests were installed, the furnace ran for 2 years without any repair at all, and ran another year with only 10% replacement. Cost? Less than half that of alloy.



HANDLES CHEMICAL ATTACK FOR 5 YEARS. This nozzle sprays 150°F acid into an absorbing chamber where gases are at 1800°F. This Super Refractory easily withstands this tough combination of both corrosion and sharp temperature gradient, and lasts over 5 years, compared to 2 months for metal.

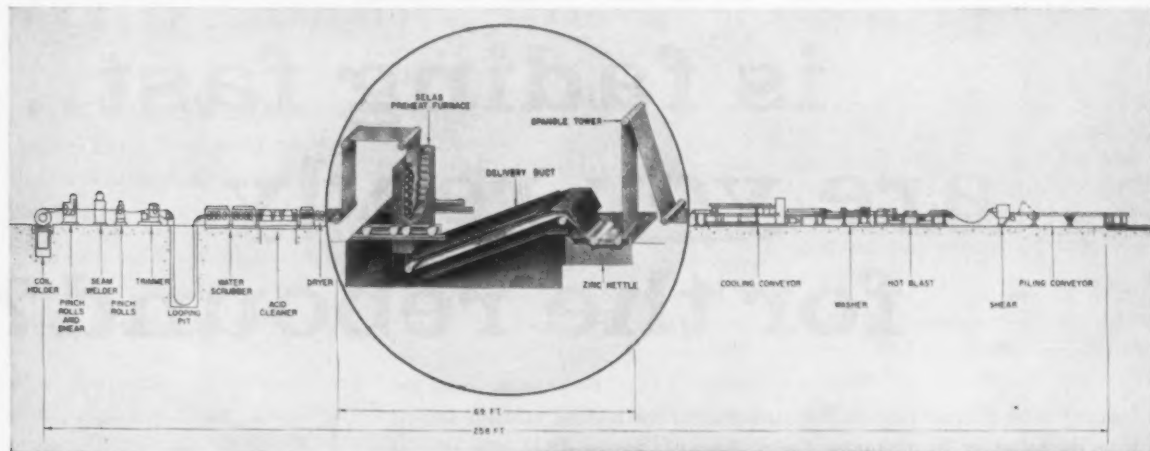
CARBORUNDUM

Registered Trade Mark

our research is your reward

ONLY ONE NEW KETTLE IN 4 YEARS

with Selas preheat for continuous strip galvanizing



151,000 TONS OF GALVANIZED STRIP BEFORE REPLACING KETTLE! Selas Gradation® unit, consisting of furnace and delivery duct, replaced fluxing and drying equipment; was fitted into the 69 feet available between strip cleaning and spangle tower. Furnace accommodates strip from 18 to 30 gage, from 24 to 48 in. wide, at speeds from 56 to 225 fpm.

Weirton Steel Company, a division of National Steel Corporation, has extended kettle life and eliminated downtime for kettle repairs on its No. 1 galvanizing line through the use of this unusual Selas strip preheating furnace. One kettle produced 151,000 tons of coated strip!

Weirton formerly fired the kettle externally. The strip was partially preheated and fluxed by conventional methods. In the presence of the flux, the aluminum (added to the bath to improve adherence) attacked the kettle at an alarming rate, shutting down the line for kettle repairs every few weeks.

This problem was solved by a unique approach to continuous galvanizing . . . that of employing preheated strip to maintain the temperature of the molten zinc.

The Selas furnace preheats the strip to 950°F, thus eliminating all kettle firing during line operation. The strip supplies enough heat to hold zinc bath temperature at 850°F, although zinc slabs are added to the bath without premelting. In addition, by preheating without oxidation, this direct-fired furnace eliminates the need for fluxing.

Since the start-up of this Selas preheat furnace in 1954, Weircoloy, the product of Weirton No. 1 gal-



vanizing line, has demonstrated its ability to take the severest draw or bend without cracking or peeling the coating. Furthermore, monthly production has been increased 30%.

Most important, the first kettle used with Selas preheat was replaced in July 1957, after production of 151,000 tons of coated strip with no downtime for kettle repairs. The second kettle is still going strong!

Perhaps the concept and technique of Gradation heat processing—engineered by Selas—can help you solve steel mill or metalworking problems. Write for reprint giving full details of this Weirton installation and Bulletin S1056 "Selas Gradation Heating in the Steel Mill." Address Dept. 110, Selas Corporation of America, Dresher, Pa.

Gradation is a registered trade name of Selas Corporation of America.

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CORPORATION OF AMERICA
DRESHER, PENNSYLVANIA

Heat and Fluid Processing Engineers
DEVELOPMENT • DESIGN • CONSTRUCTION



An announcement of interest to
manufacturers of steel parts

Improvements in today's

STRESSPROOF®
STEEL BARS

WITH COPPER

- 1 100,000 PSI YIELD STRENGTH** in all sizes . . . without heat treating.
- 2 IMPROVED PHYSICAL PROPERTIES** . . . better fatigue life wearability, and resistance to atmospheric corrosion. Over-all quality is improved.
- 3 IMPROVED MACHINABILITY** . . . STRESSPROOF with copper now machines faster and better than ever. It gives longer tool life, better finish, and more production from a day's run, according to shop production records.
- 4 CLOSER TOLERANCES** . . . Tolerances for rounds have been tightened to meet the need for more precise parts as follows:

1/4" to 1 1/2"	Over 1 1/2" to 2 1/2"	Over 2 1/2" to 3 3/8"
+ .000	+ .000	+ .000
- .004	- .005	- .006

- 5 COMPARED WITH OTHER STEELS, STRESSPROOF COSTS EVEN LESS TODAY** . . . Also saves machining and heat treat costs, and you get a better quality part. It will pay you to take another look at this improved material.

Your STEEL SERVICE CENTER stocks contain today's STRESSPROOF. It has been produced and shipped over a several months' period.

JUST PUBLISHED! Use this coupon to request your copy of new bulletin, "Improvements in Today's STRESSPROOF Steel Bars."



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Company _____

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New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 105.

Metal Cleaner

Non-flammable, a phosphoric acid type material cleans and de-rusts most metals. It applies hot or cold, by dipping, brushing, swabbing or spraying. Literature describes it. (Enthone, Inc.)

For free copy circle No. 1 on postcard, p. 105

Compressors

A 20-page bulletin describes centrifugal compressors for steel mill and foundry use. Ratings based on ASME standards appear in tabular form for typical pressure-volume-horsepower selections in the range of pressures and volumes most frequently encountered. (American Blower.)

For free copy circle No. 2 on postcard, p. 105

Honing

A manufacturer of precision honing equipment is offering a 16-page case history booklet. It gives production rates, size, tolerance, stock removal and finish data on 99 widely diversified parts from 1/8 to 2 3/4 in. ID. (Sunnen Products Co.)

For free copy circle No. 3 on postcard, p. 105

Welding Manual

Instructional information designed to train and qualify individuals in welding aluminum by the inert gas process is presented in a 144-page book. This is one of the most complete works on the subject. Nor-

mally it sells to individuals for a dollar. (For free copy write on company letterhead to Tech. Publications Dept., Kaiser Aluminum & Chemical Sales, Inc., 919 N. Michigan Ave., Chicago 11, Ill.)

Furnace

A new electric high-temperature furnace operates up to 3100°F with no need for a protective atmosphere. Because of its long life, non-oxidizing, non-flaking, oxide coating protected elements, the furnace has uses in a large variety of metals jobs. Further details are available in a bulletin. (K. H. Huppert Co.)

For free copy circle No. 4 on postcard, p. 105

Metalworking

"Metalworking Profiles," is a new 12-page booklet. It's a plant-to-plant tour showing how a variety of firms gain economy and efficiency of operation. (Whiting Corp.)

For free copy circle No. 5 on postcard, p. 105

Welding Supplies

Welding supplies and accessories are cataloged in a 52-page booklet. It covers: fluxes and ferrous and nonferrous rods for gas welding, protective clothing, goggles, electrode holders, sparklighters, cable, hose, weld cleaning tools, cylinder trucks and many other items, for both arc and gas welding. (Air Reduction Co.)

For free copy circle No. 6 on postcard, p. 105

Design In 3-D

Designing in 3-D is discussed in a catalog which contains instructions for assembling thousands of parts and materials used in building industrial scale models. With its

help designers can build models quickly and easily. This permits seeing a finished design in realistic miniature before drafting. Savings, the catalog says, can reach 50 pct in drafting and design time. (Scott Industries, Inc.)

For free copy circle No. 7 on postcard, p. 105

Blind Bolts

A brochure describes a new blind bolt kit for repairing aircraft or missile structures, particularly where access is difficult. (Hi-Shear Rivet Tool Co.)

For free copy circle No. 8 on postcard, p. 105

Synthetic Sapphire

Synthetic sapphire, an infrared optical material, is introduced in an 11-page booklet. (Linde Co., Crystal Products Dept.)

For free copy circle No. 9 on postcard, p. 105

OBI Press

A bulletin presents a new 40-ton OBI press. This press has a steel weldment frame that provides generous ram and bed areas and depth of throat to accommodate large die sets. (Sales Service Machine Tool Co.)

For free copy circle No. 10 on postcard, p. 105

Machine Drives

Drives, illustrated in a 16-page booklet, provide precise, adjustable machine speeds from in-plant alternating-current circuits. (Reliance Electric & Engineering Co.)

For free copy circle No. 11 on postcard, p. 105

Lubricant

Use of "non-fluid" oil for shake-outs and vibrating screens is dis-

STANDARDIZE WITH VERSATILE AMBALLOY STEELS

This enables metal-users to simplify operations and save money. By standardizing with versatile Amballoy—personalized steels from Byers—you can whittle your necessary chemistries to one or two. Then, through heat-treating, you can obtain the wide variety of exacting physical characteristics you require.

Such sensible programming pays off quickly. There's an instant streamlining effect on your inventory. There's less capital tied up. Less unproductive space to account for.

So, investigate Amballoy as the workhorse material for your critical applications. Call up your local Steel Service Center stocking Amballoy steels. The Byers metallurgist will furnish his name. Or, write or call: Manager of Steel Sales, ATLantic 1-8110, A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

SAVE THROUGH YOUR STEEL SERVICE CENTER

He stocks an infinite variety of all the sizes and shapes and grades and finishes you metal-users have to have in a hurry.

Your Steel Service Center performs this function as a service to you. He can do it at a fraction of the cost you would have to pay to do the job yourself. He does his own slitting, flame cutting, sawing, shearing. He minimizes your fabricating and heat-treating costs. Delivery? 24 hours or less.

He's the man with the big inventory. It's his business to assume much of the risk. Furnish much of the space—the capital—the equipment. Get Amballoy steels from him.

And if you need help in standardizing on the *right* alloys for your material requirements, call us:
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You can add new storage space to your plant with a mobile Bucyrus-Erie Transit Crane. You need less space for maneuvering. No space is wasted for permanent overhead installations or footings.

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Trim your plant budget with a versatile, money-saving Bucyrus-Erie transit machine. Contact your nearby Bucyrus-Erie distributor today and get all the facts.

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FREE LITERATURE

cussed in a 4-page brochure. It also tells about this oil's use for lubrication of pneumatic tools and equipment. (N. Y. & N. J. Lubricant Co.) For free copy circle No. 12 on postcard, p. 105

Stainless Steels

A 32-page booklet gives data on special purpose stainless steel sheet and strip grades. (Washington Steel Corp.)

For free copy circle No. 13 on postcard, p. 105

Phosphating

A new phosphating analysis kit lets metalworkers determine if their products can adapt to phosphating and its many paint adhesion advantages. The kit is free to any metalworking manufacturer, whether or not he's currently phosphating. (For free copy write on company letterhead to Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif.)

Graphic Displays

Over 435 pressure-sensitive tapes of many sizes, colors, and patterns are illustrated in a 32-page booklet. (Chart-Pak, Inc.)

For free copy circle No. 14 on postcard, p. 105

Motors

Continuing its 50th anniversary program, a motor producer has brought out a new line of vertical syncogear motors. These provide rugged, dependable, internally-g geared power for industrial agitator applications. A bulletin gives details. (U. S. Electrical Motors Inc.)

For free copy circle No. 15 on postcard, p. 105

Lube Systems

Centralized power lubrication systems are examined in a 4-page bulletin. For low or high pressure jobs, these tube systems automatically or semi-automatically lubricate all bearings simultaneously on machines while they run. (Lincoln Engineering Co.)

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ASK THE MEN IN THE PLANT!

*They'll Tell You the
Thing They Want Most
in a Safety Switch*
is SAFETY THEY CAN SEE

—and that means



VISIBLE BLADES



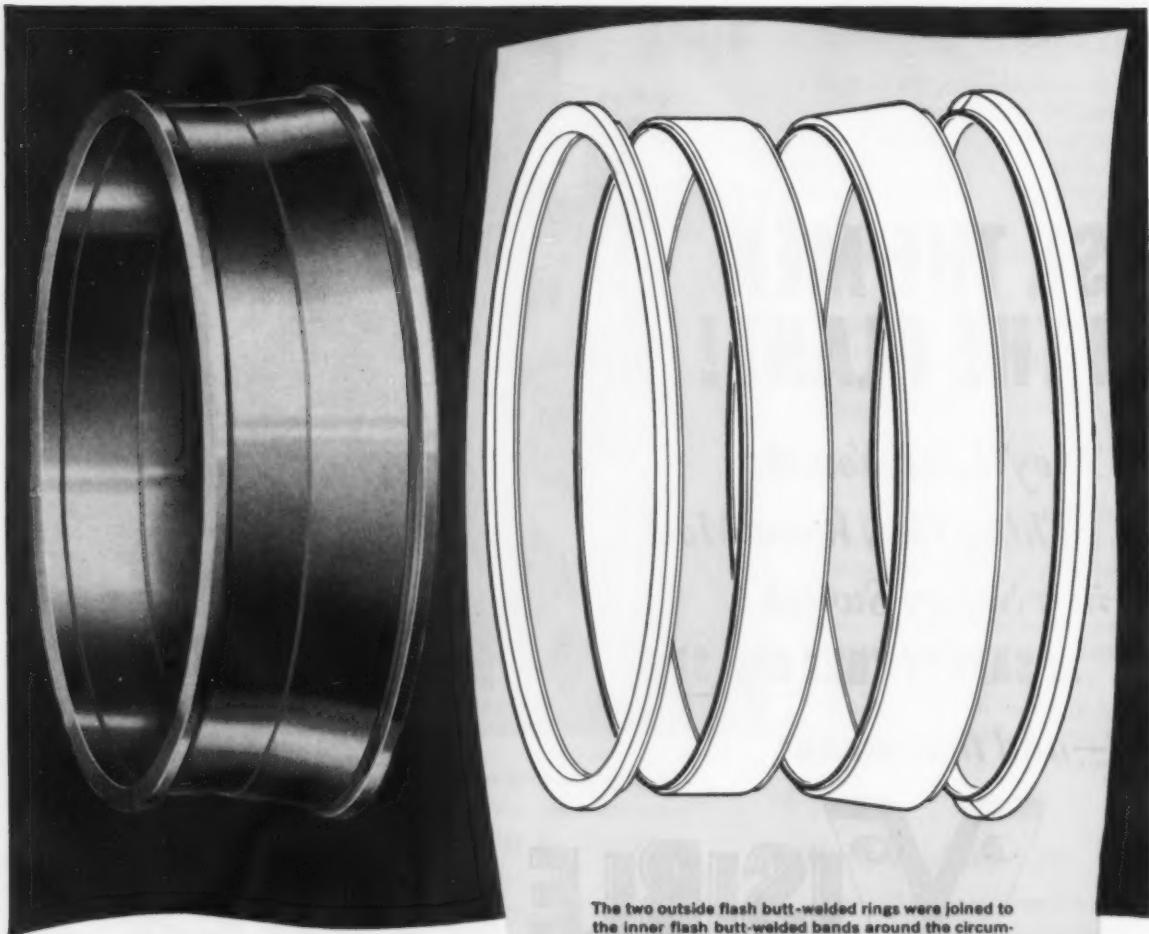
The men who pull the switches will tell you what can happen when a switch, *believed* to be open — *isn't*. A lot of things can happen—and every one of them is bad. Personnel is in danger. Motors can single-phase. Machinery and work can be damaged. Down-time can skyrocket.

Doesn't it make sense to insist on **Visible Blade** construction which gives you a road block against any of those possibilities? Doesn't it make equally good sense to insist on the safety switch which gives you that construction—plus a lot of other performance advantages?

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE



SQUARE D COMPANY



The two outside flash butt-welded rings were joined to the inner flash butt-welded bands around the circumference by submerged arc welding. The two halves were then welded together to complete the assembly.

Tricky

Welded Fabrication Cuts Cost of this Precision Assembly

To reduce material and machining time, Amweld® produced this 340 lb. turbine casing as a 4-piece welded assembly. Four flash butt-welded rings were joined together by submerged arc welding. The material used was AMS-5723, a high temperature alloy. Amweld's know-how, gained from fabricating hard-to-weld metals, enabled their engineers to develop a satisfactory technique for producing these aircraft components in quantity. The result — assemblies which met all specifications — and a substantial reduction in cost for a large manufacturer of aircraft engines.

If you would like to obtain complete information on the capabilities of American Welding and how we can be of assistance to you — phone or write today. Our local representative will be happy to call and discuss your requirements.

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FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Induction Heating

Induction heating is covered in a booklet. It describes a variety of power tubes in induction heaters. (Sylvania Electric Products Inc.)

For free copy circle No. 17 on postcard

Stainless Steels

ELC (extra-low-carbon) stainless steels are presented in a booklet. It says types 304L and 316L provide a simple, economical means of preventing harmful carbide precipitation in stainless steel weldments. (Armco Steel Corp.)

For free copy circle No. 18 on postcard

Metals Handbook

A 192-page precision steel, flat rolled metals handbook contains some 100 pages of practical technical data for everyday use. (For free copy write on company letterhead to: Precision Steel Warehouse, Inc., 3500 North Wolf Road, Franklin Park, Ill.)

Cranes

Standard component cranes in a new line serve heavy industrial uses. They come in spans up to 120 ft, capacities 5 to 25 tons, for floor or cage operation. An 8-page bulletin describes them in full. (Manning, Maxwell & Moore, Inc.)

For free copy circle No. 19 on postcard

Valves

The condensed version of a valve maker's catalog lists more than 95 pct of the firm's line. The 28-page publication covers bronze

brazed joint valves and corrosion resistant nickel-iron ones. A forged and cast steel section shows valve trim designations and pressure temperature charts with ratings to latest ASA specs. (Ohio Injector

For free copy circle No. 20 on postcard

Knitted Mesh

Knitted mesh, its properties and uses are discussed in a booklet. (Metal Textile Corp.)

For free copy circle No. 21 on postcard

Induction Heating

High frequency induction heating equipment appears in a 12-page bulletin. It covers: heat stations and generator control units, heat treating, annealing, brazing, forging, shrink fitting. (Magnethermic Corp.)

For free copy circle No. 22 on postcard

Palletizing

A report tells how Gunitite Foundries Corp. cuts costs in palletizing wheel and brake assemblies. It explains steel strapping's role in this cost cutting. (Acme Steel Co.)

For free copy circle No. 23 on postcard

Buffing, Polishing

Job-engineered buffing and polishing machinery is the subject of a 4-page booklet. (Divine Bros. Co.)

For free copy circle No. 24 on postcard

Motorized Spindles

Motorized spindles covered in a catalog run from ½ to 10 hp. Also illustrated and described are belt driven spindles, feeds, slides and accessories. (Cincinnati Electrical Tool Co.)

For free copy circle No. 25 on postcard

Centrifugal Castings

Recent ASME literature on centrifugally cast steel pipe has been reprinted. Maximum allowable stress values (psi) covering carbon, low alloy and high alloy steels are

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FREE LITERATURE

tabulated in the bulletin under 24 different temperature classifications, ranging from -20° to 1500°F . (Sandusky Foundry & Machine Co.)

For free copy circle No. 26 on postcard

Metal Furniture

Executive desks are described in a 4-page bulletin. (Standard Pressed Steel Co.)

For free copy circle No. 27 on postcard

Drum Separator

Ceramic magnet separation equipment is featured in a bulletin. This is the Indox V drum separator for continuous and automatic removal of tramp iron in process industries. (Stearns Magnetic Products.)

For free copy circle No. 28 on postcard

Plastic Tooling

Plastic tooling, its uses and advantages are outlined in an 8-page booklet. (Arvin Industries, Inc.)

For free copy circle No. 29 on postcard

Porcelain Panels

Designing for flatness in porcelain enamel panels is the subject of a 16-page brochure. (Ingram-Richardson Mfg. Co.)

For free copy circle No. 30 on postcard

Gear Reducer

Gear reducers in a wide range of ratios up to 10,000 hp are offered in a bulletin. Shaft arrangements include horizontal or vertical parallel shaft, in-line or right angle with horizontal or vertical shaft. (Western Gear Corp.)

For free copy circle No. 31 on postcard

Refrigerator

Designed for cryogenic storage, a new liquid nitrogen refrigerator is announced in a 4-page folder. The refrigerator holds 392 cu in.

of items such as: chemicals, metallurgical samples, or small metal parts for shrink-fitting. It keeps these at a constant -320°F . (Linde Co.)

For free copy circle No. 32 on postcard

Motors

Wound rotor motors are subjects of a bulletin. These 5 to 150-hp motors serve either crane or general uses. (General Electric Co.)

For free copy circle No. 33 on postcard

Duct Heaters

A 4-page bulletin describes gas-fired unit and duct heaters. (American Blower Corp.)

For free copy circle No. 34 on postcard

Roller Chains

Comprehensive is the word for a new book on precision steel roller chains and sprockets. Containing 154 pages, it's a practical textbook on roller chain for both power transmission and conveyor service. (Link Belt Co.)

For free copy circle No. 35 on postcard

Industrial TV

Industrial television equipment is dealt with in a 12-page bulletin. It gives suggestions for equipment selection. Case histories illustrate how this equipment stands up even under rugged demands of heavy industry. (Diamond Power Specialty Corp.)

For free copy circle No. 36 on postcard

Shell Molding

Silicone parting agents for shell molding are discussed in a 4-page bulletin. (Silicones Div., Union Carbide Corp.)

For free copy circle No. 37 on postcard

Tags

Tags move merchandise! Such is the theme of a 4-page brochure. It points out that surveys in metalworking indicate tags boost sales 13 to 1 sometimes. (Tag Mfg. Institute.)

For free copy circle No. 38 on postcard

Power-Up with new
Westinghouse *Life-Line H*
d-c motors



**Ten times longer insulation life
under any temperature conditions**

HERE'S WHY: New silicone insulation in Westinghouse Life-Line® "H" d-c motors and generators stands up under temperatures which turn ordinary insulation to a cinder. High-temperature silicone insulation is used with the full complement of iron and copper required for low Class B temperature. Result: Life-Line "H" shrugs off emergency overloads and abnormal ambients to keep production rolling, maintenance down.

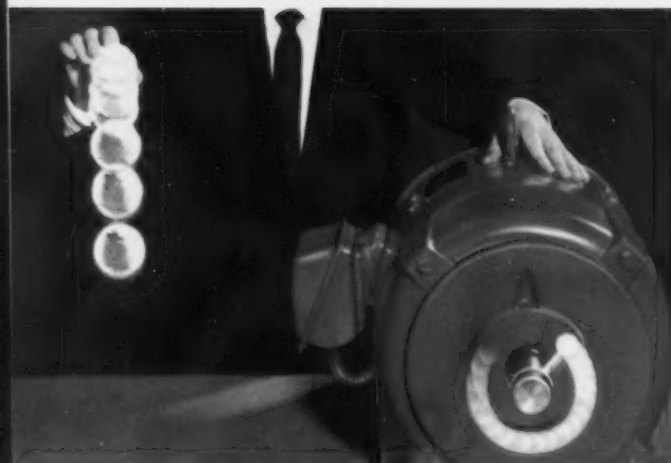
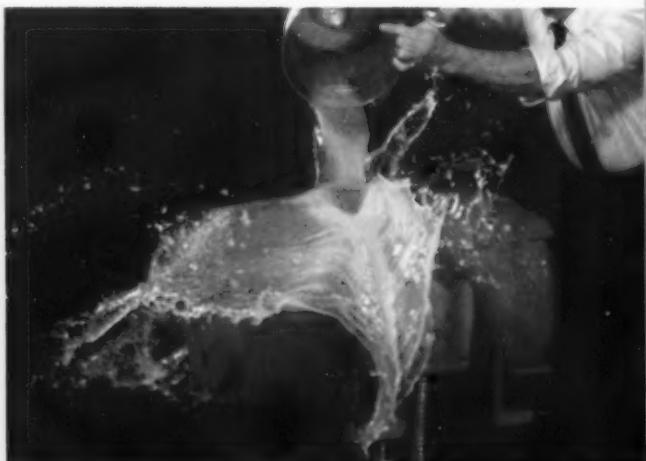
Plus ... these other important advantages

YOU CAN BE SURE...IF IT'S **Westinghouse**

These exclusive features of the new Westinghouse **Life-Line H** d-c motor guarantee top performance . . . longer, trouble-free life

CLEANER, COOLER OPERATION results from new controlled ventilation system of Life-Line "H." Ordinary d-c motors draw air in at commutator end, contaminate windings by drawing carbon dust from commutator brush wear *into* the machine. Life-Line "H" reverses this flow. Air and carbon dust are expelled at commutator end . . . assuring cleaner, cooler windings . . . longer motor life . . . less maintenance.

GREATER PROTECTION . . . most complete and advanced protection available in dripproof industrial d-c machines. Elimination of uncovered side openings . . . heavy, cast end brackets . . . effective seals throughout . . . all combine to provide outstanding resistance to liquids, vapors and dirt. This means longer life with greater reliability . . . minimum maintenance under all operating conditions.



FASTEST RESPONSE . . . 35 per cent increase in commutating ability . . . up to 55 per cent lower mechanical inertia . . . and up to 30 per cent reduction in electrical inertia mean that the new Westinghouse Life-Line "H" d-c motor provides the fastest acceleration, quickest reversing and closest speed regulation. This means more production, better product quality, minimum complexity of control.

SIMPLIFIED MAINTENANCE . . . With the new Life-Line "H," maintenance is not only substantially reduced but periodic inspections are also greatly simplified. For example: as shown above, Uniforce brushholder fingers lock out . . . brushes can be inspected or changed with one hand. And Uniforce tension remains constant throughout brush life . . . no need to adjust pressure as brushes wear.

For information about the ways you can profitably put the new Life-Line "H" motor to work, contact your nearby Westinghouse representative. Or, write

Westinghouse Electric Corporation, P. O. Box 868,
3 Gateway Center, Pittsburgh 30, Pa. J1-22123

YOU CAN BE SURE...IF IT'S Westinghouse

Machine Rapidly Produces Cans

Instead of making a can at a time, one manufacturer forms two together. Then it slits them apart.

Result: 50 pct more output.

■ A metal-can maker's new equipment produces cans at more than 750 a minute. This is 50 pct faster than previous production rates.

The new "two-high" can line, in use at Continental Can Co., makes can bodies in tandem. It then separates them, along pre-scored lines, into individual units. The first com-



Two at a time, cans roll off this new production line.

mercial line has proved fully effective, and additional lines are nearing completion, the company states.

How Old Way Works—The conventional method of making can bodies forms cylinders by wrapping individual "blanks" of steel around a horn or mandrel. Opposing ends of blanks, bent at an angle of nearly 180°, interlock. The seam that forms is then soldered.

Normally this operation is continuous at 425 to 550 can bodies a minute, says the can firm. One can end is then attached to the body.

Cans are tested for leaks by air pressure, at the same speed. The tester automatically rejects defective cans.

The other can end goes on at the canner's plant after filling the can.

How New Way Works—The new method uses double-sized blanks. These are scored before forming into cylinders by a scoring device set to make a partial cut. After forming the tandem cylinders and soldering the seam, the process separates the double bodies along the score line.

Continental is currently exploring methods which might produce can bodies more than two at a time at even higher speeds.

Materials

Uranium moves into new field—superconductors

Uranium, best known as a nuclear fuel, has yielded a new "family" of superconductors. These superconductors permit an electric current, once started in them, to flow in undiminished strength forever.

The new compounds were found during research at Westinghouse Electric Co. on electrical resistance of uranium alloys at less than one degree above absolute zero. This is 459° below zero Fahrenheit.

Include Manganese, Iron — The new superconductors, four in all, include the first ever known to con-

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 105. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

tain manganese and iron. These two elements always have been considered alien to the existence of superconductivity. All are known as "intermetallic compounds" and are alloys of uranium and one other metal.

"Such superconductors would make possible electrical and electronic devices not now even visualized," says a Westinghouse spokesman.

Controls

Ultra-sensitive control responds to millionths of a volt

A new ultra-sensitive temperature controller responds to thermocouple output fluctuations of one-millionth of a volt.

Applicable to all types of electric heat treating furnaces, the electronic controller is particularly valuable in precise temperature applications where either the heater or product temperature can change rapidly.

Hagan Chemicals & Controls, Inc., is the controller's developer.

Power

Pulleys provide constant speed regardless of load changes

Constant speed regardless of wide load variations; this is a key feature of new variable-speed pulleys.

A cam automatically maintains required belt tension for a given load. Thus, pulley faces do not spread. Pitch diameter holds at the desired setting. Belts never experience excessive pressure since contact springs serve only to maintain initial tension.

Lovejoy Flexible Coupling Corp. is the manufacturer.

New Production Ideas

Equipment, Methods and Services

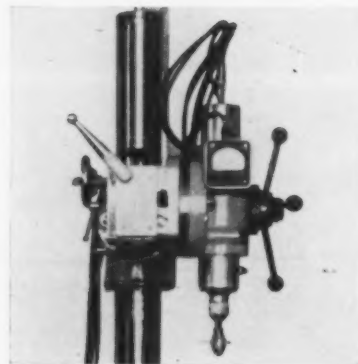


Ultrasonic Generator Has Remote Controls

High volume, all-day production cleaning is performed by this ultrasonic generator. Featuring a 3-kw average power output, it activates up to 6 sq ft of transducer area, or 300 gal of cleaning solution. The unit boasts motor tuning, twin oscillator construction and, for the first time, remote control. The remote control panel connects to the ultrasonic unit through a multi-conductor cable. This makes it

handy for production cleaning set-ups; the panel can combine with other instruments located at a central control area. The operator thus can adjust the entire cleaning procedure without leaving his post. Its special motor tuning features provide easy and reliable frequency adjustment between 36 to 40 kc for high cleaning efficiency. (Branson Ultrasonic Corp.)

For more data circle No. 39 on postcard, p. 105

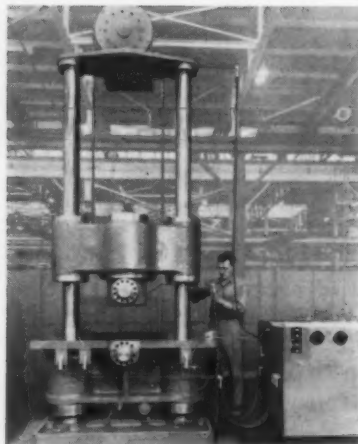


Disintegrator Removes Broken Taps, Drills

Removal of broken taps, drills, reamers, etc., is relatively easy with this disintegrator. Taps from the smallest size, No. 00, to the largest can be removed in minutes. Yet, it does not damage workpieces nor distort threads. Tools and dies are worked in the heat-treated stage; thus they aren't annealed. Rockwell hardness isn't affected, either. Compound angle cuts can be made without pilot bushings and deep

hole drilling. Three 360° setups give universal all-angle operation for a wide range of difficult jobs. The disintegrator also removes such items as set screws, hardened bearings, races, hardened pins or case hardening on shafts. It drills holes in practically any material, including titanium, hardened steels, honeycomb aluminum, etc. (Cammann Mfg. Co.)

For more data circle No. 40 on postcard, p. 105



Tester Exerts 400,000 lbs on Metal Specimens

Exerting some 400,000 lb of tension or compression on metal specimens, parts or structures, this new testing machine comes in two sections. First is a press section weighing 19,000 lb; the other is a 2000-lb control console. The latter contains electric motor-driven hydraulic pumps, control components and an indicator dial. Tension and compression tests can be done in the same testing area due to the unit's design. This eliminates mov-

ing specimens or parts from one place on the machine to another. Special hydraulic grips assure that only desired tension or compression loads are imposed. The tester's upper crosshead may be positioned hydraulically along the entire length of the smooth steel vertical support columns, then locked into position by 10,000-psi hydraulic pressure. Maximum vertical opening between grips is 66 in. (Tatnall Measuring Systems Co.)

For more data circle No. 41 on postcard, p. 105

YOUR SPECIAL VALVE MAY ALREADY BE IN PRODUCTION



10,000 PSI solenoid operated Shut-off valve.



250 PSI 4-way spring centered miniature non inter-flow valve.



3000 PSI inline manual shut-off valve.



3000 PSI 3-way explosion-proof solenoid valve with manual override.



3000 PSI Dual 3-way, 3-position manual non inter-flow valve.



3000 PSI 4-way non inter-flow manual valve built to military specifications.



1500 PSI 4-way spring centered manual valve with built in cylinder relief and pressure relief valves.



4000 PSI 4-way cylinder operated.



1500 PSI 4-way spring centered manual valve with built in cylinder relief valve.



1500 PSI manifold mounted manual valves on a sub base with built in check and relief valves.

The Barksdale valves shown on this page represent some of the over 1000 typical examples of modifications developed for the special requirements of original equipment manufacturers.

We are interested in "Specials" and can produce them economically, because the "Shear-Seal" design is exceptionally adaptable.

If you have a special valve requirement, call your Barksdale representative and ask to see the scores of existing modifications in Special Valve Catalog SV-158 and Remote Control Catalog RV-958, or write and outline your special requirements to:



TO FIND THE BARKSDALE REPRESENTATIVE IN YOUR AREA LOOK UNDER "VALVES" IN THE CLASSIFIED SECTION OF THE FOLLOWING PHONE BOOKS:

- | | |
|-------------------------------|----------------------------|
| Alabama, Birmingham | Minnesota, Minneapolis |
| Arizona, Phoenix | St. Paul |
| California, Los Angeles | Missouri, St. Louis |
| Oakland | Kansas City |
| San Diego | New Jersey, Jersey City |
| San Francisco | New York, Buffalo |
| San Mateo | Manhattan |
| Connecticut, Bridgeport | Syracuse |
| Hartford | North Carolina, Charlotte |
| Stamford | Ohio, Cincinnati |
| Dist. of Columbia, Washington | Cleveland |
| Illinois, Chicago | Oklahoma, Tulsa |
| Rockford | Oregon, Portland |
| Rock Island | Pennsylvania, Philadelphia |
| Indiana, Indianapolis | Pittsburgh |
| Iowa, Davenport | Tennessee, Memphis |
| Kansas, Wichita | Texas, Amarillo |
| Louisiana, New Orleans | El Paso |
| Maryland, Baltimore | Houston |
| Massachusetts, Boston | Washington, Seattle |
| Michigan, Detroit | Wisconsin, Milwaukee |

NEW EQUIPMENT

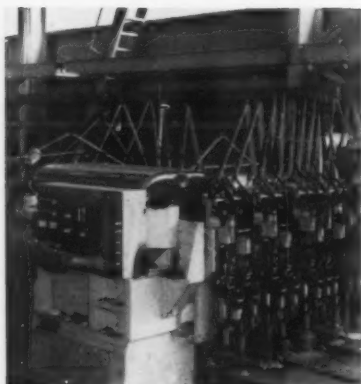


Hot Forging Press Operates At High Speeds

For open and closed die work, this 500-ton hydraulic press hot-forges at high speeds. Its bolster plates fasten to the slide and press bed; T-slots are provided. Keyways cut into the bolsters, aid die alignment and prevent misalignment during forging. Long bronze bushed guides on the slide, with full tonnage stops around the columns, prevent slide overstroking. The press works via either of two control levers. Both serve the same function; one is at the press itself;

one is remotely located. The same control levers provide short and rapid planishing strokes at full pressure. At all times the operator has control over working speed. This is because of the proportioning pump control. Such a control also lets the operator set dies without adjustments or changes in the control system. The hydraulic system is completely enclosed; it's practically dirt-free. (Elmes Engineering Div.)

For more data circle No. 42 on postcard, p. 105

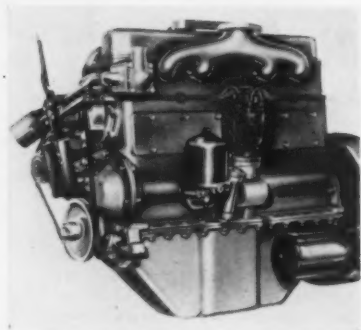


Unit Drills 18 Holes At Once in 3-in. Plate

With speed and accuracy, this machine drills 18 holes at a time in steel plates up to 3½-in. thick. It also makes nine holes at a time in heavy structural shapes. The machine's 27 flexible drill arms range by remote control over a drill bed 12½-ft wide and 120-ft long. It has two speeds. Low is 15.8 ipm; high, 65 fpm. One man, using pushbuttons, guides all operations. A control panel board is attached

to the machine and moves along the full length of the drill bed. As an example of its versatility, the unit can simultaneously work the web and flanges of a rolled H-shape without repositioning. It can drill holes singly or in groups at varied locations on the horizontal and vertical faces of structural steel shapes or plates. (Lehigh Structural Steel Co.)

For more data circle No. 43 on postcard, p. 105



New Diesels Work At Speeds Up To 3000 rpm

Two new high speed, six-cylinder diesel engines offer speeds of 1800 to 3000 rpm. They have 298 and 339 cu in. displacement. The former provides up to 112 hp at 3000 rpm; the latter, 122 hp at 3000 rpm. Particularly designed for equipment using hydraulic torque converters, they are also useful where users want low engine

weight per unit of horsepower. Key design features of the new engines include: increased crankpin diameter over the maker's standard diesels (2½-in. compared with 2-in.); larger main bearing diameter (2¾-in. as against 2½-in.) The company's standard line serves to 1800 rpm. (Hercules Motors Corp.)

For more data circle No. 44 on postcard, p. 105



Melting Furnace Has Bottled Gas Heat Source

Considerably small and inexpensive, this newly developed melting furnace has just completed successfully a significant test run. Its designer and builder says it recently underwent a 500-hour test operation with satisfactory results. For brass and aluminum melting, the unit has a 25-lb capacity (brass).

Fuel for it comes from bottled gas; however, natural gas can also be used. Compressors or blowers of air aren't necessary with it. Weight is just 95 lb. Equipped with a bottled gas burner, the furnace sells for around \$135. (W. C. Cheney Mfg. Co.)

For more data circle No. 45 on postcard, p. 105

Costs down, production up with Continuous-Cast Bronze Castings. There's no question about it—Asarco's unique process for producing continuous-cast shapes can save you money in many ways. And help you toward a better product in the bargain! For one thing, the alloys produced by continuous casting meet the same specifications as other castings but in performance, they're measurably superior. In fact, their greater strength and hardness open the way to cost-saving substitutions. And second, there's no greater production efficiency than working with the shapes you want in the continuous lengths you want, in dimensions closer to final finished parts. Write today for the cost-saving story on continuous castings. Continuous-Cast Products Department, American Smelting and Refining Company, Perth Amboy Plant, Barber, New Jersey; on the West Coast, Kingwell Bros., Ltd., 457 Minna St., San Francisco; in Canada, Federated Metals Canada, Ltd., Toronto and Montreal.

CONTINUOUS-CAST DEPARTMENT OF



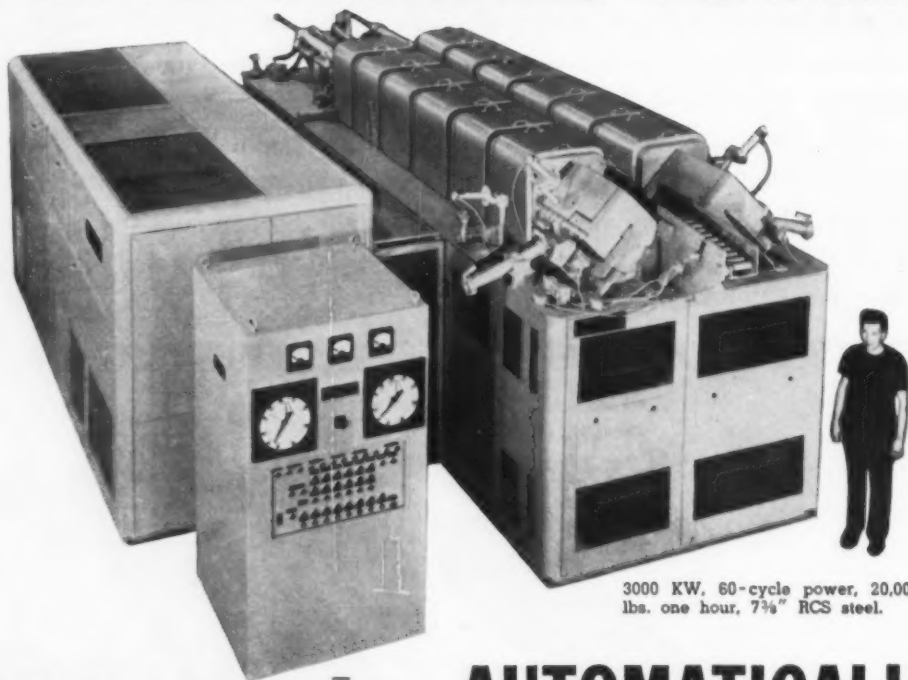
ASARCO
AMERICAN SMELTING AND REFINING COMPANY

INDUCTION FORGING HEATERS

THAT

START

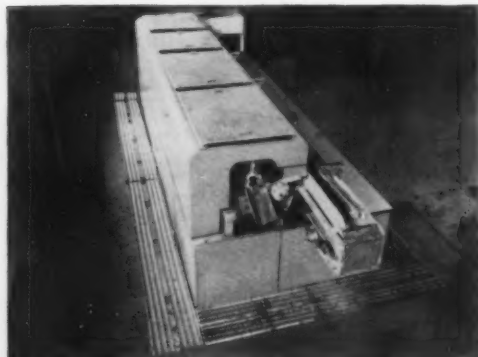
STOP



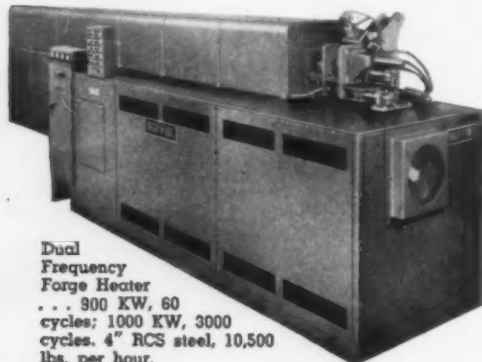
3000 KW, 60-cycle power, 20,000 lbs. one hour, 7½" RCS steel.

AND HOLD

AUTOMATICALLY



Dual Frequency Forge Heater . . . 500 KW, 960 cycle; 500 KW, 60 cycle. 2" - 4" RCS steel, 6000 lbs. per hour.



Dual Frequency Forge Heater . . . 900 KW, 60 cycles; 1000 KW, 3000 cycles. 4" RCS steel, 10,500 lbs. per hour.

These induction heaters for steel forging billets differ from any forge billet heaters ever built.

- They are empty at the start—using only two or three dummy billets.
- They have an automatic clean-out—heats are easily segregated.
- They hold at the proper temperature and have automatic voltage regulation.

The heaters keep pace with the press . . . no need of building up a stockpile of heated billets. Completely automatic, the "Magnethermics" eliminate guesswork and deliver a billet at the proper temperature every time.

Magnethermic's engineers have studied forge shop practice for a good many years. If you are considering a modernization program in your forge shop, write Magnethermic for recommendations.



Movie Available on These Automatic Forging Heaters

16 mm, color; shows the complete cycle of operation. Write to Magnethermic and advise when you would like a showing.

MAGNETHERMIC®
CORPORATION
3990 SIMON RD. • YOUNGSTOWN 7, OHIO

The Iron Age Summary

Mills Predict '59 Will Be Better

Market analysts expect '59 output to hit 110 million tons, fifth best year in history.

They're writing off 1958 as the worst year since 1949 despite steady market betterment.

■ Steel mills are writing off 1958 as the poorest production year since 1949.

At the same time, steelmakers are looking ahead to a better year in 1959 despite the possibility of a strike over new contract demands. Carefully worked out estimates are that output in '59 will hit 110 million tons. This would be the fifth best year in history.

Output in '58—Production this year is expected to be 84 million ingot tons, or about 60 pct of capacity. In 1949, when capacity was much lower, the mills operated at 81 pct of capacity and turned out 78 million tons.

To help boost demand next year, the mills are counting on (1) continued improvement in the over-all

economy, (2) a better automotive year than 1958, (3) rebuilding of steel inventories in customer plants, and (4) a pickup in the market for plates, linepipe, oil country casing and tubing, and structurals, all of which have been lagging.

Behind Market Strength—Meanwhile, the market has been perking along at a fair pace on the strength of demand for sheets and strip and galvanized sheet, a pickup in orders for hot and cold-rolled bars, a better tone in wire orders, and a smattering of support in heavier steel products.

Sheet and strip demand has been strengthening despite holdups in deliveries to some struck auto plants. The market is particularly tight in the Chicago area, where some mills have fallen behind on their delivery promises. Part of this improvement is due to rebuilding of inventories and part to better sales and prospects in such industries as appliances and farm equipment.

December Optimism—The current slowdown in deliveries to auto-

motive is strengthening belief that December steel output will be better than had been expected. This is based on an expected pickup in deliveries to auto companies once their labor problems are settled.

Earlier forecasts for December were that demand would level off and perhaps decline somewhat. Some mills still believe this will be the case. The key to the situation probably is automotive, and early reception of the new models has been encouraging.

Auto Output Boost—One buyer for an automotive firm recently received his third November production schedule boost in 45 days. His steel sheet suppliers already are one week behind originally scheduled delivery. He believes that another production increase will put him in a squeeze for November.

Some steel firms are better off than others, depending largely on location and products made. At some plants incoming orders are running ahead of deliveries, and backlogs are growing.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 2,025	Last Week 2,025	Month Ago 1,903	Year Ago 2,048
Ingot Index (1947-1949=100)	126.0	126.0	118.4	127.5
Operating Rates				
Chicago	87.0	85.0*	79.0	78.0
Pittsburgh	68.5	69.0	65.5	83.0
Philadelphia	74.0	77.0	76.0	88.0
Valley	59.5	61.5*	52.5	66.5
West	80.0	77.0*	74.0	80.0
Cleveland	78.0	82.0*	74.0	92.0
Buffalo	78.0	78.0	59.0	95.0
Detroit	79.0	80.0*	76.0	75.0
South	63.5	63.5	62.0	69.0
South Ohio River	81.0	80.0*	74.0	88.5
Upper Ohio River	85.5	88.0*	78.5	68.0
St. Louis	92.0	92.0*	96.0	92.0
Aggregate	75.0	75.0	70.5	80.0

*Revised

Prices At a Glance

	This Week	Week Ago	Month Ago	Year Ago
(Cents per lb unless otherwise noted)				
Composite price				
Finished Steel, base	6.196	6.196	6.196	5.967
Pig Iron (gross ton)	\$66.41	\$66.41	\$66.41*	\$66.42
Scrap, No. 1 hvy (Gross ton)	\$42.50	\$42.83	\$43.17	\$34.00
No. 2 bundles	\$28.83	\$28.83	\$29.17	\$29.67
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	28.10
Copper, electrolytic	29.00	27.50	26.50	27.00
Lead, St. Louis	12.80	12.30	11.30	13.30
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	97.125	96.625*	94.50	91.375
Zinc, E. St. Louis	11.00	11.00	10.00	10.00

New Designs Aid Hand Tool Sales

Industrial hand tool makers believe their new products are spurring buyer interest.

Drive launched for greater use of aluminum castings in tool design.

▪ New products are leading the highly competitive hand tool industry out of the recession.

Even though many tool producers usually are concentrating on the lucrative consumer Christmas gift market during the fall season, industrial customers won't be getting second class service this year. Like most other industries, tool business has been off for too long.

Fast Delivery—Industrial buyers are having little trouble getting quick delivery on whatever type of

hand tools they need—manual, electric, or air powered. How long these ideal conditions for the buyer will continue is another question.

While sales generally have been slow, tool makers report a steady improvement each quarter of this year. Backlogs are expected to begin piling up soon. The reasons:

Building starts are increasing; More inventory adjustments are being reported; Pessimism on the part of the consuming public is fading.

New Sander—The beginning of the upturn finds many new types of hand tools available for industrial users.

Black & Decker, largest producer of portable electric tools, is marketing a new 3 in. belt sander that features "dustless" sanding (see

photo). The portable unit attaches to any standard industrial or domestic vacuum cleaner to eliminate over 90 pct of all dust and fine metal powder.

This dustless feature provides longer belt life; cleaner, more healthful working conditions; and it permits sanding in the same area where painting is being done, according to B&D.

Black & Decker has also introduced a new heavy-duty vacuum cleaner for top-capacity vacuuming or material recovery. The unit attaches to any standard open-head 55-gal drum to give a full pick-up capacity of 48 gal dry or 40 gal wet material.

More Use of Forgings?—Harvey Aluminum Co. of Torrance, Calif., has launched a product development program to intensify the use of aluminum forgings for hand tools.


In reviewing reports made by field servicemen to tool manufacturers, Harvey reports a frequent complaint was the failure of cast aluminum handles and parts to withstand ordinary on-the-job abuse.

The company says it has developed a special type of aluminum forging that has proved more efficient and practical than conventional cast aluminum components.

Advantages Given—The first phase of Harvey's program concerns press forged handles for trowels, spray guns, drills, power hammers, and similar implements. Unlike castings, aluminum forgings are almost unbreakable and can be subjected to severe working conditions, Harvey claims.



DUSTLESS SANDING: A worker smooths sheet metal surface with a Black & Decker 3-inch "dustless" belt sander. B&D claims it eliminates over 90 pct of dust and fine metal powder generated during sanding.



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structures to the
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Imposing office buildings of glass and steel, rising to dominate a city's skyline . . . clean, windowless factories encompassing acres in air-conditioned comfort . . . these and the millions of other daring examples of tomorrow's architecture will be built with, and around, more steel piping than we can hardly imagine. Youngstown, today, is anticipating tomorrow's need for more and better steel pipe—whether for fluid transmission or structural purposes. Advancements in metallurgy and steelmaking facilities will make certain that when expanding needs of the future call for better steel pipe... *Youngstown can supply it.*



THE

YOUNGSTOWN

SHEET AND TUBE COMPANY

Youngstown, Ohio

Manufacturers of Carbon, Alloy and Yaloy Steel

Stainless Sales Show Renewed Sparkle

September was the best month so far this year for stainless producers.

USS has revised stainless plate extra quantities both upward and downward.

Stainless steel sales are gaining strength after a cloudy nine months.

Buyer demand pushed stainless production last month above 84,600 tons, according to the American Iron and Steel Institute. This made September the best month so far in 1958.

Producers say demand is coming from a variety of industries. Automotive stainless buying, while increasing, is still depressed.

Greater ordering by steel service centers reflects the "grass-roots" nature of the sales revival. Warehouse sales of stainless started to climb in early summer.

"Our recession ended in May," says Washington Steel Corp., which has a large number of steel service center accounts.

But almost without exception producers report a substantial pick-up in the last 30 to 60 days. "Our order volume is materially better for all product lines," says Allegheny Ludlum Steel Corp. Stainless sheet, strip, and wire are setting the pace at A-L.

Price Spat—Despite the sales improvement, mill-warehouse relations are being strained. Some smaller stainless mills are said to be waiving packaging and quantity extras on service center orders. The absorption by the mills has the effect of a \$40 a ton price cut. Larger stainless producers have not generally met this competition, but price reductions may be coming.

Stainless Extras—U. S. Steel has

revised its quantity extras on stainless plate both up and down. On present shipments buyers may pay higher prices. But users may change their shopping pattern later to take advantage of price benefits of large quantity ordering.

Sheet and Strip—Sheet deliveries are lengthened a week or two in all markets. (See box.) Shipping delays are mounting in **Midwest** markets where mills are booked almost through December. Buyers there are now settling for January delivery on hot-rolled, cold-rolled, and galvanized sheet.

Plate—Unlike sheet, plate deliveries are shrinking or, at best, holding at low levels. Heavy plate is quoted for shipment in two weeks by **East Coast** mills. Light plate and floor plate are listed at 2-3 weeks.

Pittsburgh area mills predict some improvement in orders in November. Plate demand there is inching upward.

Bar—Hot-rolled bar deliveries are advancing about a week in **Midwest** markets. **Chicago** area buyers report some mill shipments are delinquent. Mills at **Pittsburgh** say the improvement is partly due to increased ordering by cold finishers. As a result, hot-rolled bar production there will hit its highest level during October.

Oil Country Goods—Republic Supply Co., former oil country pipe distributor for Republic Steel, is re-joining the family. Republic will reacquire the supply company which it sold in 1948 to get expansion capital. Since that time Republic Supply has continued as a distributor of Republic butt-weld pipe, linepipe, and electricweld casing and tubing.

Fastener Prices—Recent changes in fastener pricing, the latest Oct. 20, have been in a downward direction. Under new discount schedules an individual consumer may be paying more. But the general trend is toward lower prices.

Delivery Promises at a Glance

	Pittsburgh	Chicago	Cleveland	Detroit	East	West Coast
CR Carbon Sheet	5-6 wks	7-8 wks	5-6 wks	4-6 wks	5-6 wks	6 wks
HR Carbon Sheet	3-4 wks	5-7 wks	4-5 wks	3-5 wks	4 wks	4-5 wks
CR Carbon Strip	5-6 wks	4-6 wks	5-6 wks	4-6 wks	5-6 wks	4-6 wks
HR Carbon Strip	3-4 wks	4-5 wks	4-5 wks	3-5 wks	4 wks	4 wks
HR Carbon Bars	2-3 wks	4-6 wks	3-4 wks	2-4 wks	2-4 wks	2-3 wks
CF Carbon Bars	2-4 wks	3-6 wks	2-3 wks	2-4 wks	1-3 wks	1-2 wks
Heavy Plate	1-4 wks	3-4 wks			2 wks	4-6 wks
Light Plate	1-2 wks	3-5 wks	3-4 wks		2-3 wks	4-6 wks
Merchant Wire	1 wk	1-4 wks	1 wk		Stock	3-4 wks
Oil Country Goods	Stock	1-3 wks	Stock		Stock	
Linepipe	2-8 wks	4-8 wks	Stock		2-4 wks	4-6 wks
Buttweld Pipe	Stock	3-5 wks	Stock	Stock	Stock	2-4 wks
Std. Structural	1-4 wks	2-5 wks		2-5 wks	2-4 wks	4 wks
CR Stainless Sheet	1-4 wks		3-4 wks	2-3 wks	2-3 wks	
CR Stainless Strip	1-4 wks		3-4 wks	2-3 wks	2-3 wks	

COMPARISON OF PRICES

(Effective Oct. 28, 1958)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Oct. 28 1958	Oct. 21 1958	Sept. 30 1958	Oct. 29 1957
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	4.925¢
Cold-rolled sheets	6.275	6.275	6.275	6.05
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.60
Hot-rolled strip	5.10	5.10	5.10	4.925
Cold-rolled strip	7.425	7.425	7.425	7.17
Plate	5.30	5.30	5.30*	5.12
Plates, wrought iron	13.55	13.55	13.55	13.15
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$10.30	\$10.30	\$10.30	\$10.30
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	9.00
Special coated mfg. ternes	9.55	9.55	9.55	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.425¢
Cold finished bar	7.65	7.65	7.65	7.30
Alloy bars	6.725	6.725	6.725	6.475
Structural shapes	5.50	5.50	5.50	5.275
Stainless bars (No. 302)	45.00	45.00	45.00	45.00
Wrought iron bars	14.90	14.90	14.90	14.45
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	7.65¢
Rails: (per 100 lb.)				
Heavy rails	\$5.75	\$5.75	\$5.75	\$5.525
Light rails	6.725	6.725	6.725	6.50
Semifinished Steel: (per net ton)				
Rerolling billets	\$80.00	\$80.00	\$80.00	\$77.50
Slabs, rerolling	80.00	80.00	80.00	77.50
Forging billets	99.50	99.50	99.50	96.00
Alloy blooms, billets, slabs	119.00	119.00	119.00	114.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.15¢
Skelp	5.05	5.05	5.05	4.875
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	5.967¢

Finished Steel Composite

Weighed index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite:

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

AVERAGE of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

	Oct. 28 1958	Oct. 21 1958	Sept. 30 1958	Oct. 29 1957
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$70.57	\$70.57	\$70.57*	\$70.51
Foundry, Southern Cin'ti	73.87	73.87	73.87	71.65
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07*	70.01
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese 74-76 pct Mn, cents per lb†	12.25	12.25	12.25	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	\$66.41	\$66.41	\$66.41*	\$66.42
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$45.50	\$45.50	\$44.50	\$33.50
No. 1 steel, Phila. area	39.50	40.50	39.50	36.00
No. 1 steel, Chicago	42.50	42.50	45.50	33.50
No. 1 bundles, Detroit	35.50	35.50	35.50	22.50
Low phos., Youngstown	46.50	46.50	45.50	33.50
No. 1 mach'y cast, Pittsburgh	51.50	51.50	51.50	50.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	50.50
No. 1 mach'y cast, Chicago	53.50	53.50	53.50	41.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	\$42.50	\$42.83	\$43.17	\$34.00
No. 2 bundles	28.83	28.83	29.17	25.67
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	\$14.50	\$14.50	\$14.50	\$15.38
Foundry coke, prompt	\$18-18.50	\$18-18.50	\$18-18.50	\$17.50-\$19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.00	27.50	26.50	27.00
Copper, Lake, Conn.	29.00	27.50	26.50	27.00
Tin, Straits, N. Y.	97.125‡	96.625*	94.50	91.375
Zinc, East St. Louis	11.00	11.00	10.00	10.00
Lead, St. Louis	12.80	12.80	11.30	13.30
Aluminum, virgin ingot	26.80	26.80	26.80	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	33.00

† Tentative. ‡ Average. * Revised.

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Soft Spots Appear In Firm Market

Prices in Midwest are holding firm, but weakness develops in the East and South.

Automotive strikes are holding down the supply of industrial scrap.

▪ Optimism still holds in many districts even though uncertainty in the steel operating outlook is undermining dealer confidence. Price strength varies from steady to weak, according to local conditions.

One of the factors responsible for dealer optimism in the Midwest is continued strikes at some automotive plants. These are reducing the amount of competitive industrial scrap normally in the market at this time. But as the strikes drag on, the slowly rising mill operating rate might be hurt.

In the East and South, mills were paying \$1 under last week's prices for openhearth grades and had no trouble filling orders. The October upturn had failed to materialize for dealers in those districts. Many saw the handwriting on the wall and were unwilling to continue building inventories.

Countering the weakness in the East and South is continued dealer resistance to mill offers in the major markets of the Midwest.

The IRON AGE heavy melting Composite Price slipped 33¢ to \$42.50 due to weakening in the Philadelphia district.

Pittsburgh — Prices of dealer openhearth grades are firm in a quiet market. Prices of low phos and No. 1 factory bundles are up

\$1 in response to sharp cutbacks in industrial scrap generation. Dealers are still bullish but the auto work stoppages have created uncertainty both with respect to scrap generation and mill operations. Turnings are up \$1 in sympathy with sales in nearby districts.

Chicago—Scrap continues tight in this district. Volume to the mills is low. Broker buying prices continue to tighten and most dealers seem reluctant to sell at current prices. Even speculative buying based on strong broker prices seems to have netted little tonnage. Continued automotive strikes have tightened supply of factory bundles.

Philadelphia — Prices of openhearth grades dropped \$1 on a mill purchase. Brokers had no trouble filling the order. Many dealers were disappointed over failure of the market to turn upward and were willing to move material at the lower price. Big mills in the district are still sitting on their hands. Export is dead.

New York — This market has slowed down and some brokers are talking a \$30 top for No. one heavy melting. But they admit that only old orders are moving at this price. New business would probably go at \$31. Cast, turnings, and stainless are unchanged.

Detroit—Little or no activity is evident at the dealer level as the scrap trade turns its attention to industrial lists. Industrial production in October fell well below estimates due to strikes which slow-

ed auto industry output. No complaints were reported from steel mills in cases where scrap deliveries fell below orders.

Cleveland—Factory bundles for November are occupying top interest. Price for this grade is up \$1, the only change. Ingot rate in Cleveland and the Valley continues to climb and prime dealer material is scarce. Lists for the month will be larger. Foundry market continues its slow pickup.

St. Louis—The market remains steady with prices unchanged. Mills are reported building scrap inventories slightly as a buffer against possible curtailment of delivery next winter.

Birmingham—Although dealers generally are bullish, brokers think the market is not as strong as in the last few weeks. Some consumers say their next buys will be at lower prices. Primary openhearth grades already have slumped \$1. No. 2 heavy melting sold at quoted prices to an Alabama mill.

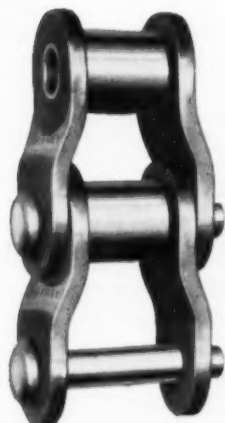
Cincinnati—Brokers raised their buying price \$1 for top grades to fill orders but found dealers little interested. Dealers are hoping for a stronger market in November.

Buffalo—The market is inactive and prices are unchanged. A mill is expected to come into the market next week and dealers are hoping for a slight increase in prices.

Boston — Prices are holding steady, but dealers and brokers are still waiting for something to happen. Neither domestic nor export demand show signs of improving in the near future.

West Coast—This market continues dull. November prices are expected to remain at existing low levels unless mill operations pick up.

Houston—The market outlook is good. A district mill ordered about 40,000 tons of scrap for November at going prices and authorized a springboard in buying the scrap.



Steel Thimble Roller Chain—If you are driving a mixing drum or other equipment at an inclined angle, you can cut wear on chain drive by using this Jeffrey "offset" STR type.

Don't let work-horse appearance fool you... chain is a *precision* product. Its tensile strength, fatigue limit and resistance to wear affect the performance and life of *the equipment you make*.

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STR Hollow Pin Chain conveys bread through bakery ovens on smooth-running rollers. Conveniently spaced hollow pins provide an easy method for attaching trays or other fixtures.

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- Earth and rock drilling units
- Elevating graders
- Excavators and trenchers
- Farm machinery
- Food machinery
- Glass batching
- Ice making units
- Industrial ovens
- Lumber and sawmill machinery
- Mining machines
- Pickling and plating machines
- Portable gravel plants
- Refuse collection trucks
- Road rollers
- Steel mill machinery
- Units for washing and drying materials



Steel Knuckle Chain—Movable packer plate inside this cylindrical refuse truck is operated by using Jeffrey chain as a tension element and driving chain from the truck power takeoff.

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JEFFREY

SCRAP PRICES (Effective Oct. 28, 1958)

Pittsburgh

No. 1 hvy. melting	45.00 to 46.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	45.00 to 46.00
No. 1 factory bundles	49.00 to 50.00
No. 2 bundles	32.00 to 33.00
No. 1 busheling	45.00 to 46.00
Machine shop turn.	21.00 to 22.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	25.00 to 26.00
Low phos. punch'g plate	49.00 to 50.00
Heavy turnings	34.00 to 35.00
No. 1 RR hvy. melting	47.00 to 48.00
Scrap rails, random lgth.	54.00 to 55.00
Rails 2 ft and under	57.00 to 58.00
RR specialties	52.00 to 53.00
No. 1 machinery cast.	51.00 to 52.00
Cupola cast.	44.00 to 45.00
Heavy breakable cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	225.00 to 230.00
18-8 turnings	125.00 to 130.00
430 bundles and solids	125.00 to 130.00
410 turnings	50.00 to 60.00

Chicago

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundles	43.00 to 44.00
No. 1 factory bundles	46.00 to 47.00
No. 2 bundles	30.00 to 31.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	21.00 to 22.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	22.00 to 23.00
Low phos. forge crops	52.00 to 53.00
Low phos. punch'g plate	48.00 to 49.00
Low phos. 2 ft and under	46.00 to 47.00
No. 1 RR hvy. melting	48.00 to 49.00
Scrap rails, random lgth.	53.00 to 54.00
Rerolling rails	64.00 to 65.00
Rails 2 ft and under	59.00 to 60.00
Angles and splice bars	55.00 to 56.00
RR steel bar axes	71.00 to 72.00
RR couplers and knuckles	52.00 to 53.00
No. 1 machinery cast	53.00 to 54.00
Cupola cast.	47.00 to 48.00
Heavy breakable cast.	41.00 to 42.00
Cast iron wheels	41.00 to 42.00
Malleable	57.00 to 58.00
Stove plate	44.00 to 45.00
Steel car wheels	51.00 to 52.00
Stainless	
18-8 bundles and solids	215.00 to 220.00
18-8 turnings	125.00 to 130.00
430 bundles and solids	115.00 to 120.00
430 turnings	65.00 to 70.00

Philadelphia Area

No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	39.00 to 40.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	39.00 to 40.00
Machine shop turn.	20.00 to 21.00
Mixed bor. short turn.	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Shoveling turnings	24.00 to 25.00
Clean cast. chem. borings	32.00 to 33.00
Low phos. 5 ft and under	43.00 to 44.00
Low phos. 2 ft, punch'g.	44.00 to 45.00
Elec. furnace bundles	42.00 to 43.00
Heavy turnings	33.00 to 35.00
RR specialties	47.00 to 48.00
Rails 18 in. and under	57.00 to 58.00
Cupola cast.	40.00 to 41.00
Heavy breakable cast.	42.00 to 43.00
Cast iron car wheels	44.00 to 45.00
Malleable	56.00 to 57.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	\$38.50 to \$39.50
No. 2 hvy. melting	32.50 to 33.50
No. 1 dealer bundles	39.00 to 40.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	18.00 to 19.00
Low phos. 18 in. and under	45.00 to 46.00
Rails, random length	49.00 to 50.00
Rails, 18 in. and under	55.00 to 56.00
No. 1 cupola cast.	44.00 to 45.00
Hvy. breakable cast.	36.00 to 37.00
Drop broken cast.	47.00 to 48.00

Youngstown

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	44.00 to 45.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	21.50 to 22.50
Shoveling turnings	26.00 to 27.00
Low phos. plate	46.00 to 47.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	\$41.00 to \$42.00
No. 1 busheling	32.50 to 33.50
No. 1 dealer bundles	41.00 to 42.00
No. 1 factory bundles	44.50 to 45.50
No. 2 bundles	28.50 to 29.50
No. 1 busheling	41.00 to 42.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	23.00 to 24.00
Cut structural & plates, 2 ft & under	
Drop forge flashings	47.00 to 48.00
Low phos. punch'g plate	43.00 to 44.00
Foundry steel, 2 ft & under	40.00 to 41.00
No. 1 RR hvy. melting	44.00 to 45.00
Rails 2 ft and under	56.00 to 57.00
Rails 18 in. and under	57.00 to 58.00
Steel axle turnings	25.00 to 26.00
Railroad cast.	50.00 to 51.00
No. 1 machinery cast.	49.00 to 50.00
Stove plate	45.00 to 46.00
Malleable	61.00 to 62.00
Stainless	
18-8 bundles	220.00 to 225.00
18-8 turnings	115.00 to 120.00
430 bundles	120.00 to 125.00

Buffalo

No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 busheling	36.00 to 37.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	27.00 to 28.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	16.00 to 17.00
Low phos. plate	40.00 to 41.00
Structurals and plate, 2 ft and under	
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	59.00 to 60.00
No. 1 machinery cast.	48.00 to 49.00
No. 1 cupola cast.	44.00 to 45.00

St. Louis

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	18.00 to 19.00
No. 1 RR hvy. melting	45.00 to 46.00
Rails, random lengths	48.00 to 49.00
Rails, 18 in. and under	53.00 to 54.00
Angles and splice bars	46.00 to 47.00
RR specialties	47.00 to 48.00
Cupola cast.	48.00 to 49.00
Heavy breakable cast.	38.00 to 39.00
Cast iron brake shoes	38.00 to 39.00
Stove plate	42.00 to 43.00
Cast iron car wheels	44.00 to 45.00
Rerolling rails	60.00 to 61.00
Unstripped motor blocks	39.00 to 40.00

Birmingham

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	13.00 to 14.00
Electric furnace bundles	40.00 to 41.00
Elec. furnace, 3 ft & under	37.00 to 38.00
Bar crops and plate	45.00 to 46.00
Structural and plate, 2 ft.	44.00 to 45.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	48.00 to 49.00
Rails, 18 in. and under	52.00 to 53.00
Angles and splice bars	48.00 to 49.00
Rerolling rails	59.00 to 60.00
No. 1 cupola cast.	54.00 to 55.00
Stove plate	53.00 to 54.00
Cast iron car wheels	44.00 to 45.00
Unstripped motor blocks	43.00 to 44.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	\$30.00 to \$31.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	39.00 to 40.00
Machine shop turnings	30.00 to 31.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	14.00 to 15.00
Clean cast. chem. borings	25.00 to 26.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	36.00 to 37.00
Heavy breakable cast.	34.00 to 35.00
Stainless	
18-8 prepared solids	190.00 to 195.00
430 prepared solids	85.00 to 90.00
430 prepared solids	70.00 to 75.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	34.00 to 35.00
Drop forge flashings	33.00 to 34.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Heavy breakable cast.	31.00 to 32.00
Mixed cupola cast.	40.00 to 41.00
Automotive cast.	45.00 to 46.00
Stainless	
18-8 bundles and solids	200.00 to 205.00
18-8 turnings	95.00 to 100.00
430 bundles and solids	105.00 to 110.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	\$29.00 to \$30.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	9.00 to 10.00
Shoveling turnings	12.00 to 13.00
Clean cast. chem. borings	20.00 to 21.00
No. 1 machinery cast.	33.00 to 34.00
Mixed cupola cast.	33.00 to 34.00
Heavy breakable cast.	30.00 to 31.00
Stove plate	32.00 to 33.00

San Francisco

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 cupola cast.	45.00

Los Angeles

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	17.00
Machine shop turn.	11.00
Shoveling turnings	13.00
Cast iron borings	13.00
Elec. furn. 1 ft and under (foundry)	43.00
No. 1 cupola cast.	44.00

Seattle

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	26.00
No. 1 dealer bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Busheling	20.00
Bush., new fact., prep'd.	30.00
Bush., new fact., unprep'd	24.00
Machine shop turn.	15.00
Short steel turn.	17.00
Mixed bor. and turn.	15.00
Rails, rerolling	39.00
Cast scrap	\$39.00 to \$41.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	\$40.00
No. 2 hvy. melting	34.00
No. 2 bundles	25.00
Machine shop turn.	20.00
Shoveling turnings	17.00
Cut structural plate 2 ft & under	\$45.50 to \$46.50
Unstripped motor blocks	38.75 to 39.75
Cupola cast.	47.00 to 48.00
Heavy breakable cast.	30.00 to 31.00

S-E-G-R-E-G-A-T-E-D SCRAP IS WORTH MORE



Here is how to test for INCONEL

This nickel-chromium alloy (77% nickel, 15% chromium) fills an important place in the Atomic Age. Because of its great strength and resistance to oxidation at high temperatures, it has been used in various atomic energy projects and in nose cones for rocket powered missiles.

It also finds a place in equipment for the production of antibiotics as well as in the furnace and heat treating field as a material for nitriding containers, carburizing boxes, retorts, muffles and other parts which are subjected to extreme heat.

For scrap of known analysis, our personnel, equipment, experience and strategically located facilities are specifically geared for the purchase or sale of dependably segregated metals. We welcome your inquiry.

PROCEDURE

Rub specimen with file to obtain clean surface. Add 1 drop of 10% hydrochloric acid and let react for 1 minute. Add 1 drop of 10% potassium ferricyanide. After 30 seconds, if drop has no color or turns red, green or yellow-brown, specimen belongs to nickel alloy group.

Add 1 drop concentrated nitric acid. After 1 minute, if there is no reaction, specimen belongs to one of the Hastelloy, Ilium, Nimonic, 80 nickel-20 chromium or Inconel groups.

Add a drop of concentrated hydrochloric acid and a drop of 6% sulfurous acid. After a minute, add drop of 10% potassium ferricyanide. A yellow-brown drop eliminates the 80 nickel-20 chromium alloy. The remaining specimens will have a green drop.

Add drop of concentrated hydrochloric acid and concentrated nitric acid. After a minute, add drop of 10% potassium ferricyanide. A dark brown to black color will indicate Inconel, Inconel X, Ilium G, or Ilium R.

Add drop of concentrated hydrochloric acid and after 10 seconds, if gas evolves, specimen is either Inconel or Inconel X.

Add drop of concentrated hydrochloric acid; after a minute add drop of sodium thiosulfate. Let stand a minute and add drop of 10% potassium ferricyanide. Mix drops together. After 5 minutes a cloudy, aqua colored drop will indicate INCONEL.

Luria Brothers and Company, Inc.



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Uneasiness Creeps Into Copper

Some think the market may be overextended.

The question: Will real demand pick up before a better supply weakens the market?

■ The big question in copper markets this week: Will actual consumption pick up before an increase in supply weakens the market?

Bears that turned bull to push prices up are still bulls. But they have become uneasy bulls.

What's Happened — Here's the picture:

In the third quarter mill and fabricator business started to pick up. Along with this, strikes in the U. S., Canada, and Africa signalled a shorter supply ahead.

Some buyers came out of their hand-to-mouth shell to take a position. They decided to bet on (1) Sharper rise in their own sales, and (2) extended strikes cutting supplies. The result: Hedge buying, inventory rebuilding, and higher prices.

Unsold stocks at refineries were reduced. But much of this metal was merely moved to customers' plants, rather than consumed.

More Metal—And several producers, selling more copper than they were making, announced they would put back into operation some capacity that was down.

The hedge buying is about over. Fabricator and mill inventories are improved. Fabricator business is still moving up, but slowly.

It has become a race. Consumer demand is most certainly picking

up. But the supply curve is also going to head up again when the strikes are settled and producers' additional capacity hits the market.

Answer—If demand gets there first, copper's current show of strength will be confirmed. If not, there is likely to be a sag in prices. Most copper men still say the long range trend is up. But more of them are conceding there may be storms before the market clouds clear.

Lead and Zinc

Copper men looking at this market for a hint on what they can expect can pretty well take their pick. Zinc business is picking up very well. Lead is soft.

The difference appears to be in the condition of the major buyers of the metals.

Zinc Up—Zinc sellers do their biggest business with steel companies for galvanizing, and die casters. The biggest die casting buyers are the auto companies.

Both steel and die casters are buying more zinc. One zinc seller says current buying is probably all for immediate use. He concedes that at the beginning of the month some of the business was to replenish inventories. But he believes this has been completed.

Lead Down—Two major uses for lead are for batteries and in making tetraethyl gasoline. Purchasing agents for companies in both fields say their business is still slow. One sees little real improvement until 1960, while the other is cautiously optimistic for 1959.

The general feeling is that the buying spurt that pushed the price up did not reflect improved consumption of lead. Says one buyer, "It merely shifted unused stocks from smelters to the users."

Quotas—The import quotas are having no real effect on the market, according to most in the trade. But they probably were part of the spur that caused the flurry of buying at the beginning of the month.

Some people feel that the current quotas are too generous to have much effect on the supply of both metals in this country.

Effective or not, Col. Willard F. Rockwell, chairman of the board, Rockwell Manufacturing Co. told a group of purchasing agents in Tulsa, Okla., that the import quotas for lead and zinc are "completely illogical." He believes it is undermining our foreign aid program.

Col. Rockwell says further, that the quotas will have the effect of increasing the prices of lead and zinc in this country, while lowering them to buyers in other markets. This, he predicts, will widen the edge foreign manufactured goods now have in price over U.S.-produced goods.

Tin price for the week: Oct. 22—96.50; Oct. 23—97.00; Oct. 24—97.00; Oct. 27—97.125; Oct. 28—97.125.*

* Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	8/1/58
Aluminum Ingot	26.80	26.10	8/1/58
Copper (E)	29.00	27.50	10/23/58
Copper (CS)	30.00	28.50	10/20/58
Copper (L)	29.00	27.50	10/23/58
Lead, St. L.	12.80	12.30	10/14/58
Lead, N. Y.	13.00	12.50	10/14/58
Magnesium Ingot	38.00	34.00	8/13/58
Magnesium pig	38.25	33.75	8/13/58
Nickel	74.00	64.50	12/8/58
Titanium sponge	185-205	200-250	4/1/58
Zinc, E. St. L.	11.00	10.50	10/8/58
Zinc, N. Y.	11.50	11.00	10/8/58

ALUMINUM: 99% Ingot frt allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **TIN:** see above; other primary prices, pg. 125.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship pt., frt. allowed)

Flat Sheet (Mill Finish and Plate) ("F" temper except 6061-0)

Alloy	.032		.081		.136		250-3
1100, 3003	45.7	43.8	42.8	43.3			
5052	53.1	48.4	46.9	46.0			
6061-0	50.1	45.7	43.9	44.9			

Extruded Solid Shapes

Factor	6063 T-5		6062 T-6	
6-8	42.7-44.2		51.1-54.8	
12-14	42.7-44.2		52.0-56.5	
24-26	43.2-44.7		62.8-67.5	
36-38	46.7-49.2		86.9-90.5	

Screw Machine Stock—2011-T-3

Size*	3/4		5/8-9/16		3/4-1		1 1/4-1 3/8	
Price	62.0	61.2	59.7	57.3				

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length*→	72		96		120		144	
019 gage	\$1 411	\$1 884	\$2 353	\$2 823				
024 gage	1.762	2.349	2.937	3.524				

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type→	Gage→	250		250-		.188	.081	.032
		3.00	2.00					
AZ31B Stand, Grade		67.9	69.0	77.9	108.1			
AZ31B Spec.		93.3	95.7	108.7	171.8			
Tread Plate		70.6	71.7					
Tooling Plate		73.0						

Extruded Shapes

factor→	6-8		12-14		24-26		36-38	
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2				
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2				

Alloy Ingot

AZ91B (Die Casting) 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velsco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

"A" Nickel Monel Inconel

	Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks		87	

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	52.13	49.36	52.32	
Brass, Yellow	45.57	46.11	45.51	48.48
Brass, Low	48.23	48.77	48.17	51.04
Brass, R L	49.17	49.71	49.11	51.98
Brass, Naval	49.74	44.05	52.90	
Muntz Metal	47.85	43.66		
Comm. Bz.	50.65	51.19	50.59	53.21
Mang. Bz.	53.44	47.64		
Phos. Bz. 5%	71.09	71.55		
Free Cutting Brass Rod				29.28

TITANIUM

(Base prices, f.o.b. mill)

Sheet and strip, commercially pure, \$8.50-\$10.10; alloy, \$15.96; Plate, HR, commercially pure, \$6.00-\$6.75; alloy, \$8.75-\$9.50. Wire, rolled and/or drawn, commercially pure, \$6.50-\$7.00; alloy, \$10.00-\$11.50; Bar, HR or forged, commercially pure, \$5.25-\$5.50; alloy, \$6.25-\$6.35; billets, HR, commercially pure, \$4.10-\$4.35; alloy, \$4.10-\$4.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)
Antimony, American, Laredo, Tex., 29.50
Beryllium aluminum 5% Be, Dollar per lb contained Be \$47.75
Beryllium copper, per lb cont'd Be \$43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading \$71.50
Bismuth, ton lots \$ 2.25
Cadmium, del'd \$ 1.45
Calcium, 99.9% small lots \$ 4.55
Chromium, 99.8% metallic basis \$ 1.31
Cobalt, 97-99% (per lb) \$2.00 to \$2.07
Germanium, per gm, f.o.b. Miami, \$35.00 to \$42.00
Gold, U. S. Treas., per troy oz. \$35.00
Indium, 99.9%, dollars per troy oz. \$ 2.25
Iridium, dollars per troy oz. \$70 to \$80
Lithium, 98% \$11.00 to \$14.00
Magnesium, sticks, 100 to 600 lb. \$ 69.00
Mercury, dollars per 76-lb flask, f.o.b. New York \$233 to \$236
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel \$ 69.60
Palladium, dollars per troy oz. \$15 to \$17
Platinum, dollars per troy oz. \$57 to \$60
Rhodium \$120.00 to \$125.00
Silver ingots (kg per troy oz.) \$90.375
Thorium, per kg \$43.00
Vanadium \$ 3.45
Zirconium sponge \$ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot	
No. 115	29.00
No. 120	28.25
No. 123	27.00
80-10-10 ingot	
No. 305	33.25
No. 315	31.25
88-10-2 ingot	
No. 210	40.25
No. 215	36.00
No. 245	32.75
Yellow ingot	
No. 405	24.00
Manganese bronze	
No. 421	25.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.	24.75-25.00
0.60 copper max.	24.50-24.75
Piston alloys (No. 122 type)	24.25-25.25
No. 12 alum. (No. 2 grade)	21.50-22.00
108 alloy	22.00-22.50
195 alloy	25.00-26.00
13 alloy (0.60 copper max.)	24.25-24.75
AXS-679 (1 pct zinc)	21.75-22.25

Steel deoxidizing aluminum notch bar

Grade 1—95-97 1/2%	22.50-23.50
Grade 2—92-95%	21.25-22.25
Grade 3—90-92%	20.25-21.25
Grade 4—85-90%	17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	23 1/2	22 1/2
Yellow brass	18	15 1/2
Red brass	20	20
Comm. bronze	21 1/2	20 1/2
Mang. bronze	16	15 1/2
Yellow brass rod ends	16	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	26 1/4
No. 2 copper wire	23 1/4
Light copper	24 1/2
*Refinery brass	24 1/2
Copper bearing material	23 1/2
*Dry copper content	

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	26
No. 2 copper wire	24 1/2
Light copper	22 1/2
No. 1 composition	21 1/2
No. 1 comp. turnings	21
Hvy. yellow brass solids	15 1/2
Brass pipe	17 1/2
Radiators	17 1/2

Aluminum

Mixed old cast.	12 1/4-13
Mixed new clips	16 1/2-16 3/4
Mixed turnings, dry	13 1/2-14 1/2

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	23 1/4-24
No. 2 copper wire	21 1/2-22
Light copper	19 1/2-20
Auto radiators (unsweated)	14-14 1/2
No. 1 composition	17 1/2-18
No. 1 composition turnings	16 1/2-17
Cocks and faucets	14-14 1/2
Clean heavy yellow brass	12 1/2-12 3/4
Brass pipe	14-14 1/2
New soft brass clippings	14 1/2-15
No. 1 brass rod turnings	12-12 1/2

Aluminum

Alum. pistons and struts	5 1/4-5 3/4
Aluminum crankcases	9 1/4-9 3/4
1100 (2S) aluminum clippings	13 1/2-13 3/4
Old sheet and utensils	9 1/4-9 3/4
Borings and turnings	6 1/4-6 3/4
Industrial castings	6 1/4-6 3/4
2024 (24S) clippings	10 1/4-11 1/4

Zinc

New zinc clippings	4 1/4-5
Old zinc	3 1/4-3 3/4
Zinc routings	2-2 1/4
Old die cast scrap	1 1/2-2

Nickel and Monel

Pure nickel clippings	52-54
Clean nickel turnings	37-40
Nickel anodes	52-54
Nickel rod ends	52-54
New Monel clippings	30-32
Clean Monel turnings	30-32
Old sheet Monel	26-28
Nickel silver clippings, mixed	18
Nickel silver turnings, mixed	15

Lead

Soft scrap lead	8-8 1/4
Battery plates (dry)	2 1/2-3
Batteries, acid free	2 1/2-2 3/4

Miscellaneous

Block tin	75-76
No. 1 pewter	59-60
Auto babbitt	39-40
Mixer common babbitt	9 1/2-10
Solder joints	13 1/2-13 3/4
Siphon tops	42
Small foundry type	10 1/2-10 3/4
Monotype	10 1/2-10 3/4
Lino. and stereotype	9 1/2-9 3/4
Electrotype	8 1/2-8 3/4
Hand picked type shells	6 1/2-7
Lino. and stereo. dress	3 1/2-3
Electro dress	2 1/2-2 3/4

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES

BILLETS, BLOOMS, SLABS

PIL-ING

SHAPES STRUCTURALS

STRIP

Carbon
Rerolling
Net Ton

Carbon
Forging
Net Ton

Alloy
Net Ton

Sheet
Steel

Carbon

Hi Str.
Low
Alloy

Carbon
Wide-
Flange

Hot
rolled

Cold-
rolled

Hi Str.
H.R. Low
Alloy

Hi Str.
C.R. Low
Alloy

Alloy
Hot-
rolled

Alloy
Cold-
rolled

EAST	Bethlehem, Pa.			\$119.00 B3		5.55 B3	8.10 B3	5.55 B5								
	Buffalo, N. Y.	\$80.00 R3, B3	\$99.50 R3, B3	\$119.00 R3, B3	6.50 B3	5.55 B3	8.10 B3	5.55 B3	5.10 B3, R3	7.425 S10, R7	7.575 B3					
	Phila., Pa.									7.875 P15						
	Harrison, N. J.														15.55 C11	
	Conschocken, Pa.		\$104.50 A2	\$126.00 A2						5.15 A2		7.575 A2				
	New Bedford, Mass.										7.875 R6					
	Johnstown, Pa.	\$80.00 B3	\$99.50 B3	\$119.00 B3		5.55 B3	8.10 B3									
	Boston, Mass.										7.975 T8					
	New Haven, Conn.										7.875 D1					
	Baltimore, Md.										7.425 T8				15.90 T8	
	Phoenixville, Pa.					5.55 P2			5.55 P2							
	Sparrows Pt., Md.									5.10 B3		7.575 B3				
	New Britain, Bridgeport, Wallingford, Conn.			\$119.00 N8							7.875 W1, S7					
Pawtucket, R. I. Worcester, Mass.										7.975 N7, A5				15.90 N7 15.70 T8		
MIDDLE WEST	Alton, Ill.									5.30 L1						
	Ashland, Ky.									5.10 A7		7.575 A7				
	Canton-Massillon, Dover, Ohio		\$102.00 R3	\$119.00 R3, \$114.00 T5							7.425 G4		10.00 G4		15.50 C11	
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	\$80.00 U1, R3	\$99.50 U1, R3, W8	\$119.00 U1, R3, W8	6.50 U1	5.50 U1, W8, P15	8.05 U1, Y1, W8	5.50 U1	5.10 W8, N4, A1	7.525 A1, T8, M8	7.575 W8		8.40 W8, S9, T3	15.55 A1, S9, G4, T8		
	Cleveland, Ohio									7.425 A5, J3		10.75 A5	8.40 J3			
	Detroit, Mich.			\$119.00 R5						5.10 G3, M2	7.425 M2, D1, D2, P11	7.575 G3	10.00 D2			
	Anderson, Ind.										7.425 G4					
	Gary, Ind. Harbor, Indiana	\$80.00 U1	\$99.50 U1	\$119.00 U1, Y1		5.50 U1, I3	8.05 U1, J3	5.50 I3	5.10 U1, I3, Y1	7.425 Y1	7.575 U1, I3, Y1	10.90 Y1	8.40 U1, Y1			
	Stirling, Ill.	\$80.00 N4				5.50 N4			5.20 N4							
	Indianapolis, Ind.										7.575 R5				15.70 R5	
	Newport, Ky.									5.10 A9			8.40 A9			
	Niles, Warren, Ohio Sharon, Pa.		\$99.50 S1, C10	\$119.00 C10, S1					5.10 R3, S1	7.425 R3, T4, S1	7.575 R3, S1	10.00 S1, R3	8.40 S1	15.55 S1		
	Owensboro, Ky.	\$80.00 G5	\$99.50 G5	\$119.00 G5												
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	\$80.00 U1, P6	\$99.50 U1, C11, P6	\$119.00 U1, C11, B7	6.50 U1	5.50 U1, J3	8.05 U1, J3	5.50 U1	5.10 P6	7.425 J3, B4 7.525 E3			8.40 S9	15.55 S9		
	Weirton, Wheeling, Fallsburg, W. Va.				6.50 U1, W3	5.50 W3		5.50 W3	5.10 W3	7.425 F3	7.575 W3	10.00 W3				
	Youngstown, Ohio	\$80.00 R3	\$99.50 Y1, C10	\$119.00 Y1			8.05 Y1		5.10 U	7.425 Y1, R5	7.575 U1, Y1	10.95 Y1	8.40 U1, Y1	15.55 R5, Y1		
	WEST	Fontana, Cal.	\$90.50 K1	\$109.00 K1	\$140.00 K1		6.30 K1	8.85 K1	6.45 K1	5.85 K1	9.275 K1					
Geneva, Utah			\$99.50 C7			5.50 C7	8.05 C7									
Kansas City, Mo.						5.60 S2	8.15 S2					8.65 S2				
Los Angeles, Torrance, Cal.			\$109.00 B2	\$139.00 B2		6.20 C7, B2	8.75 B2		5.85 C7, B2	9.325 J3 9.30 C1		9.60 B2	17.75 J3			
Minnequa, Colo.						5.00 C6			6.20 C6	9.375 C6						
Portland, Ore.						6.25 O2										
San Francisco, Niles, Pittsburg, Cal.			\$109.00 B2			6.15 B2	8.70 B2		5.85 C7, B2							
Seattle, Wash.		\$113.00 B2			6.25 B2	8.80 B2		6.10 B2								
SOUTH	Atlanta, Ga.					5.70 A8			5.10 A8							
	Fairfield, Ala. City, Birmingham, Ala.	\$80.00 T2	\$99.50 T2			5.50 T2, R3, C16	8.05 T2		5.10 T2, R3, C16		7.575 T2					
	Houston, Lone Star, Texas		\$104.50 S2	\$124.00 S2		5.00 S2	8.15 S2					8.65 S2				

(Effective Oct. 27, 1958)

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES

SHEETS

WIRE ROD

TINPLATE†

BLACK PLATE

Hot rolled 18 ga. & hvyr. Cold-rolled Calvanized (Hot-dipped) Enamel-ing Long Terns Hi Str. Low Alloy H.R. Hi Str. Low Alloy C.R. Hi Str. Low Alloy Galv. Cokes* 1.25-lb. base box Electro** 0.25-lb. base box Holloware Enameling 29 ga.

		Hot rolled 18 ga. & hvyr.	Cold-rolled	Calvanized (Hot-dipped)	Enamel-ing	Long Terns	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	WIRE ROD	TINPLATE†	BLACK PLATE				
											Cokes* 1.25-lb. base box	Electro** 0.25-lb. base box	Holloware Enameling 29 ga.			
EAST	Buffalo, N. Y.	5.10 B3	6.275 B3				7.525 B3	9.275 B3		6.40 W6	† Special coated mig. terns deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 125 lb. deduct \$2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. ** ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.00. Differential 1.00 lb. 0.25 lb. add 65¢.					
	Claymont, Del.															
	Coteseville, Pa.															
	Conschocken, Pa.	5.15 A2	6.325 A2				7.575 A2									
	Harrisburg, Pa.															
	Hartford, Conn.															
	Johnstown, Pa.									6.40 B3						
	Fairless, Pa.	5.15 U1	6.325 U1				7.575 U1	9.775 U1						\$10.15 U1	\$8.85 U1	
	New Haven, Conn.															
	Phoenixville, Pa.															
MIDDLE WEST	Sparrow Pt., Md.	5.10 B3	6.275 B3	6.875 B3			7.525 B3	9.275 B3	10.025 B3	6.50 B3	\$10.15 B5	\$8.85 B3				
	Worcester, Mass.									6.70 A5						
	Trenton, N. J.															
	Alton, Ill.									6.60 L1						
	Ashland, Ky.	5.10 A7		6.875 A7	6.775 A7		7.525 A7									
	Canton-Massillon, Dover, Ohio			6.875 R1, R3												
	Chicago, Joliet, Ill.	5.10 W8, A1					7.525 U1, W8			6.40 A5, R3, W8						
	Sterling, Ill.									6.50 N4, K2						
	Cleveland, Ohio	5.10 R3, J3	6.275 R3, J3	7.65 R3*	6.775 R3		7.525 R3, J3	9.275 R3, J3		6.40 A5						
	Detroit, Mich.	5.10 G3, M2	6.275 G3, M2				7.525 G3	9.275 G3								
MIDDLE WEST	Newport, Ky.	5.10 A1	6.275 A1													
	Gary, Ind. Harbor, Indiana	5.10 U1, I3, Y1	6.275 U1, I3, Y1	6.875 U1, I3	6.775 U1, I3, Y1	7.225 U1	7.525 U1, Y1, I3	9.275 U1, Y1		6.40 Y1	\$10.05 U1, Y1	\$8.75 I3, U1, Y1	7.50 U1, Y1			
	Granite City, Ill.	5.20 G2	6.375 G2	6.975 G2	6.875 G2							\$8.85 G2	7.60 G2			
	Kokomo, Ind.			6.975 C9						6.50 C9						
	Mansfield, Ohio	5.10 E2	6.275 E2			7.225 E2										
	Middletown, Ohio		6.275 A7	6.875 A7	6.775 A7	7.225 A7										
	Niles, Warren, Ohio Sharon, Pa.	5.10 R3, N3, S1	6.275 R3	6.875 R3, 7.65 R3*	6.775 N3, S1	7.225 N3, S1*, R3	7.525 R3, S1	9.275 S1, R3				\$8.75 R3				
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 U1, J3, P6	6.275 U1, J3, P6	6.875 U1, J3, 7.50 E3*	6.775 U1		7.525 U1, J3	9.275 U1, J3	10.025 U1, J3	6.40 A5, J3, P6	\$10.05 W5, J3	\$8.75 U1, J3	7.50 U1, J3			
	Portsmouth, Ohio	5.10 P7	6.275 P7							6.40 P7						
	Weirton, Wheeling, Follansbee, W. Va.	5.10 W3, W5	6.275 W3, F3, W5	6.875 W3, W5, 7.50 W3*		7.225 W3, W5	7.525 W3	9.275 W3			\$10.05 W5, W3	\$8.75 W5, W3	7.50 W5			
WEST	Youngstown, Ohio	5.10 U1, Y1	6.275 Y1	7.50 J3*	6.775 Y1		7.525 Y1	9.275 Y1		6.40 Y1						
	Fontana, Cal.	5.85 K1	7.525 K1				8.275 K1	10.575 K1			\$10.00 K1	\$9.50 K1				
	Geneva, Utah	5.20 C7														
	Kansas City, Mo.									6.65 S2						
	Los Angeles, Torrance, Cal.									7.20 B2						
	Minnequa, Colo.									6.65 C6						
SOUTH	San Francisco, Niles, Pittsburg, Cal.	5.00 C7	7.225 C7	7.625 C7						7.20 C7	\$10.00 C7	\$9.50 C7				
	Atlanta, Ga.															
	Fairfield, Ala. Alabama City, Ala.	5.10 T2, R3	6.275 T2, R3	6.875 T2, R3	6.775 T2					6.40 T2, R3	\$10.15 T2	\$8.85 T2				
	Houston, Texas									6.65 S2						

* Electrogalvanized sheets.

(Effective Oct. 27, 1958)

*7.425 at Sharon-Niles is 7.225

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES

	BARS										PLATES				WIRE
	Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright				
EAST	Bethlehem, Pa.			6.725 B3	9.025 B3	8.30 B3									
	Buffalo, N. Y.	5.675 R3,B3	5.675 R3,B3	7.70 B5	6.725 B3,R3	9.025 B3,B5	8.30 B3	5.30 B3						8.00 W6	
	Claymont, Del.									7.50 C4	7.95 C4				
	Coatesville, Pa.							5.30 L4		7.50 L4	7.95 L4				
	Conshohocken, Pa.							5.30 A2	6.375 A2	7.50 A2	7.95 A2				
	Harrisburg, Pa.							5.30 P2	6.475 P2						
	Milton, Pa.	5.825 M7	5.825 M7												
	Hartford, Conn.			8.15 R3		9.325 R3									
	Johnstown, Pa.	5.675 B3	5.675 B3		6.725 B3		8.30 B3	5.30 B3		7.50 B3	7.95 B3			8.00 B3	
	Fairless, Pa.	5.825 U1	5.825 U1		6.875 U1										
	Newark, N. J. Camden, N. J.			8.10 W10, P10		9.20 W10, P10									
	Bridgeport, Putnam, Willimantic, Conn.			8.20 W10 8.15 J3	6.80 N8	9.175 N8									
	Sparrows Pt., Md.		5.675 B3					5.30 B3		7.50 B3	7.95 B3			8.10 B3	
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			8.20 B5, C14		9.325 A5,B5								8.30 A5, W6	
Spring City, Pa.			8.10 K4		9.20 K4										
MIDDLE WEST	Alton, Ill.	5.875 L1												8.20 L1	
	Ashland, Newport, Ky.							5.30 A7, A9		7.50 A9	7.95 A7				
	Canton, Massillon, Mansfield, Ohio	6.15* R3		7.65 R3,R2	6.725 R3 6.475 T5	9.025 R3,R2 8.775 T5		5.30 E2							
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 U1,R3, W8,N4,P13	5.675 U1,R3, N4,P13,W8 5.875 L1	7.65 A5, W10,W8, B5,L2,N9	6.725 U1,R3, W8	9.025 A5, W10,W8, L2,N8,B5	8.30 U1,W8, R3	5.30 U1,A1, W8,I5	6.375 U1	7.50 U1, W8	7.95 U1, W8			8.00 A5,R3, W8,N4, K2,W7	
	Cleveland, Ohio Elyria, Ohio	5.675 R3	5.675 R3	7.65 A5,C13, C18		9.025 A5, C13,C18	8.30 R3	5.30 R3,J3	6.375 J3		7.95 R3,J3			8.00 A5, C13,C18	
	Detroit, Mich.	5.675 G3	5.675 G3	7.90 P3 7.85 P8,B5 7.65 R5	6.725 R5,G3	9.025 R5 9.225 B5,P3, P8	8.30 G3	5.30 G3		7.50 G3	7.95 G3				
	Duluth, Minn.														8.00 A5
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 U1,I3, Y1	5.675 U1,I3, Y1	7.65 R3,J3	6.725 U1,I3, Y1	9.025 R3,M4	8.30 U1,Y1	5.30 U1,I3, Y1	6.375 J3, I1	7.50 U1, Y1	7.95 U1, Y1,I3			8.10 M4	
	Granite City, Ill.							5.40 G2							
	Kokomo, Ind.		5.775 C9												8.10 C9
	Sterling, Ill.	5.775 N4	5.775 N4					5.30 N4							8.10 K2
	Niles, Warren, Ohio Sharon, Pa.			7.65 C10	6.725 C10,S1	9.025 C10	7.925 S1	5.30 R3,S1		7.50 S1	7.95 R3, S1				
	Owensboro, Ky.	5.675 G5			6.725 G5										
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 U1,J3	5.675 U1,J3	7.65 A5,B4, R3,J5,C11, W10,S9,C8, M9	6.725 U1,J3, C11,B7	9.025 A5, W10,R3,S9, C11,C8,M9	8.30 U1,J3	5.30 U1,J3	6.375 U1	7.50 U1, J3,B7	7.95 U1, J3,B7			8.00 A5, J3,P6	
Portsmouth, Ohio														8.00 P7	
Weirton, Wheeling, Follansbee, W. Va.							5.30 W5								
Youngstown, Ohio	5.675 U1,R3, Y1	5.675 U1,R3, Y1	7.65 A1,Y1, F2	6.725 U1,Y1	9.025 Y1,F2	8.30 U1,Y1	5.30 U1, R3,Y1		7.50 Y1	7.95 U1,Y1			8.00 Y1		
WEST	Emeryville, Cal. Fontana, Cal.	6.425 J5 6.375 K1	6.425 J5 6.375 K1		7.775 K1		8.625 K1	6.10 K1		8.30 K1	8.75 K1				
	Geneva, Utah							5.30 C7			7.95 C7				
	Kansas City, Mo.	5.925 S2	5.925 S2		6.975 S2		8.55 S2							8.25 S2	
	Los Angeles, Torrance, Cal.	6.375 C7,B2	6.375 C7,B2	9.10 R3,P14, S12	7.775 B2	11.00 P14, S12	8.625 B2							8.95 B2	
	Minnequa, Colo.	6.125 C6	6.125 C6					6.15 C6						8.25 C6	
	Portland, Ore.	6.425 O2	6.425 O2												
	San Francisco, Niles, Pittsburg, Cal.	6.375 C7 6.425 B2	6.375 C7 6.425 B2				8.675 B2							8.95 C7,C6	
	Seattle, Wash.	6.425 B2,N6	6.425 B2				8.675 B2	6.20 B2		8.40 B2	8.85 B2				
	Atlanta, Ga.	5.875 A8	5.875 A8												8.00 A8
	Fairfield, Ala. City, Birmingham, Ala.	5.675 T2,R3, C16	5.675 T2,R3, C16	8.25 C16			8.30 T2	5.30 T2,R3			7.95 T2			8.00 T2,R3	
SOUTH	Houston, Ft. Worth, Lone Star, Texas	5.925 S2	5.925 S2		6.975 S2		8.55 S2	5.40 S2		7.60 S2	8.05 S2			8.25 S2	

† Merchant Quality—Special Quality 35¢ higher.

(Effective Oct. 27, 1958)

* Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

- A1 Acme Steel Co., Chicago
- A2 Alan Wood Steel Co., Conshohocken, Pa.
- A3 Allegheny Ludlum Steel Corp., Pittsburgh
- A4 American Cladmetals Co., Carnegie, Pa.
- A5 American Steel & Wire Div., Cleveland
- A6 Angel Nail & Chaplet Co., Cleveland
- A7 Armco Steel Corp., Middletown, Ohio
- A8 Atlantic Steel Co., Atlanta, Ga.
- A9 Acme-Newport Steel Co., Newport, Ky.
- B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
- B2 Bethlehem Pacific Coast Steel Corp., San Francisco
- B3 Bethlehem Steel Co., Bethlehem, Pa.
- B4 Blair Strip Steel Co., New Castle, Pa.
- B5 Bliss & Laughlin, Inc., Harvey, Ill.
- B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
- B7 A. M. Byers, Pittsburgh
- B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
- C1 Caltrip Steel Corp., Los Angeles
- C2 Carpenter Steel Co., Reading, Pa.
- C3 Claymont Products Dept., Claymont, Del.
- C6 Colorado Fuel & Iron Corp., Denver
- C7 Columbia Geneva Steel Div., San Francisco
- C8 Columbia Steel & Shafting Co., Pittsburgh
- C9 Continental Steel Corp., Kokomo, Ind.
- C10 Copperweld Steel Co., Pittsburgh, Pa.
- C11 Crucible Steel Co. of America, Pittsburgh
- C13 Cuyahoga Steel & Wire Co., Cleveland
- C14 Compressed Steel Shafting Co., Readville, Mass.
- C15 G. O. Carlson, Inc., Thorndale, Pa.
- C16 Connors Steel Div., Birmingham
- C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
- D1 Detroit Steel Corp., Detroit
- D2 Dearborn Div., Sharon Steel Corp.
- D3 Driver Harris Co., Harrison, N. J.
- D4 Dickson Weatherproof Nail Co., Evanston, Ill.
- E1 Eastern Stainless Steel Corp., Baltimore
- E2 Empire Reeves Steel Corp., Mansfield, O.
- E3 Enamel Products & Plating Co., McKeesport, Pa.
- E4 First Sterling, Inc., McKeesport, Pa.
- F2 Fitzsimons Steel Corp., Youngstown
- F3 Follansbee Steel Corp., Follansbee, W. Va.

- G2 Granite City Steel Co., Granite City, Ill.
- G3 Great Lakes Steel Corp., Detroit
- G4 Greer Steel Co., Dover, O.
- G5 Green River Steel Corp., Owenboro, Ky.
- H1 Hanna Furnace Corp., Detroit
- I2 Ingersoll Steel Div., Chicago
- I3 Inland Steel Co., Chicago
- I4 Interlake Iron Corp., Cleveland
- J1 Jackson Iron & Steel Co., Jackson, O.
- J2 Jessop Steel Corp., Washington, Pa.
- J3 Jones & Laughlin Steel Corp., Pittsburgh
- J4 Joslyn Mfg. & Supply Co., Chicago
- J5 Judson Steel Corp., Emeryville, Calif.
- K1 Kaiser Steel Corp., Fontana, Calif.
- K2 Keystone Steel & Wire Co., Peoria
- K3 Koppers Co., Granite City, Ill.
- K4 Keystone Drawn Steel Co., Sping City, Pa.
- L1 Laclede Steel Co., St. Louis
- L2 La Salle Steel Co., Chicago
- L3 Lone Star Steel Co., Dallas
- L4 Lukens Steel Co., Coatesville, Pa.
- M1 Mahoning Valley Steel Co., Niles, O.
- M2 McLouth Steel Corp., Detroit
- M3 Mercer Tube & Mfg. Co., Sharon, Pa.
- M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
- M6 Mystic Iron Works, Everett, Mass.
- M7 Milton Steel Products Div., Milton, Pa.
- M8 Mill Strip Products Co., Evanston, Ill.
- M9 Moltrup Steel Products Co., Beaver Falls, Pa.
- N1 National Supply Co., Pittsburgh
- N2 National Tube Div., Pittsburgh
- N3 Niles Rolling Mill Div., Niles, O.
- N4 Northwestern Steel & Wire Co., Sterling, Ill.
- N6 Northwest Steel Rolling Mills, Seattle
- N7 Newman Crosby Steel Co., Pawtucket, R. I.
- N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
- N9 Nelson Steel & Wire Co.
- O1 Oliver Iron & Steel Co., Pittsburgh
- O2 Oregon Steel Mills, Portland
- P1 Page Steel & Wire Div., Monessen, Pa.
- P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
- P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
- P4 Pittsburgh Coke & Chemical Co., Pittsburgh
- P5 Pittsburgh Screw & Bolt Co., Pittsburgh
- P6 Pittsburgh Steel Co., Pittsburgh
- P7 Portsmouth Div., Detroit Steel Corp., Detroit

- P8 Plymouth Steel Co., Detroit
- P9 Pacific States Steel Co., Niles, Cal.
- P10 Precision Drawn Steel Co., Camden, N. J.
- P11 Production Steel Strip Corp., Detroit
- P13 Phoenix Mfg. Co., Joliet, Ill.
- P14 Pacific Tube Co.
- P15 Philadelphia Steel and Wire Corp.
- R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
- R3 Republic Steel Corp., Cleveland
- R4 Roebing Sons Co., John A., Trenton, N. J.
- R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
- R6 Rodney Metals, Inc., New Bedford, Mass.
- R7 Rome Strip Steel Co., Rome, N. Y.
- S1 Sharon Steel Corp., Sharon, Pa.
- S2 Sheffield Steel Div., Kansas City
- S3 Shenango Furnace Co., Pittsburgh
- S4 Simonds Saw and Steel Co., Fitchburg, Mass.
- S5 Sweet's Steel Co., Williamsport, Pa.
- S7 Stanley Works, New Britain, Conn.
- S8 Superior Drawn Steel Co., Monaca, Pa.
- S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
- S10 Seneca Steel Service, Buffalo
- S11 Southern Electric Steel Co., Birmingham
- S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
- T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
- T2 Tennessee Coal & Iron Div., Fairfield
- T3 Tennessee Products & Chem. Corp., Nashville
- T4 Thomas Strip Div., Warren, O.
- T5 Timken Steel & Tube Div., Canton, O.
- T7 Texas Steel Co., Fort Worth
- T8 Thompson Wire Co., Boston
- U1 United States Steel Corp., Pittsburgh
- U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
- U3 Ulbrich Stainless Steels, Wallingford, Conn.
- U4 U. S. Pipe & Foundry Co., Birmingham
- W1 Wallingford Steel Co., Wallingford, Conn.
- W2 Washington Steel Corp., Washington, Pa.
- W3 Weirton Steel Co., Weirton, W. Va.
- W4 Wheatland Tube Co., Wheatland, Pa.
- W5 Wheeling Steel Corp., Wheeling, W. Va.
- W6 Wickwire Spencer Steel Div., Buffalo
- W7 Wilson Steel & Wire Co., Chicago
- W8 Wisconsin Steel Div., S. Chicago, Ill.
- W9 Woodward Iron Co., Woodward, Ala.
- W10 Wyckoff Steel Co., Pittsburgh
- W12 Wallace Barnes Steel Div., Bristol, Conn.
- Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pt) f.o.b. mills. Base price about \$200 per net ton.

	BUTTWELD																SEAMLESS							
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2-3 In.		2 In.		2 1/2 In.		3 In.		3 1/2-4 In.			
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.		
STANDARD T. & C.																								
Sparrows Pt. B3	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Youngstown R3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Fontana K1	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50										
Pittsburgh J3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
Alton, Ill. L1	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Sharon M3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Fairless N2	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Pittsburgh N1	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
Wheeling W5	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Wheatland W4	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Youngstown Y1	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
Indiana Harbor Y1	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50										
Lorain N2	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
EXTRA STRONG PLAIN ENDS																								
Sparrows Pt. B3	4.75	*9.0	8.75	*5.0	11.75	*6.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Youngstown R3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Fairless N2	4.75	*9.0	8.75	*5.0	11.75	*6.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Fontana K1	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75											
Pittsburgh J3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Alton, Ill. L1	4.75	*9.0	8.75	*5.0	11.75	*6.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Sharon M3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Pittsburgh N1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Wheeling W5	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Wheatland W4	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Youngstown Y1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Indiana Harbor Y1	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50										
Lorain N2	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		

Threads only, buttweld and seamless, 2 1/4 pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5 1/2 pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2 1/2 and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective Oct. 27, 1958)

TOOL STEEL

F.o.b. mill	W	Cr	V	Mo	Co	per lb	SAE	
18	4	1	—	—	—	\$1.84	T-1	
18	4	1	—	—	5	2.545	T-4	
18	4	2	—	—	—	2.005	T-2	
1.5	4	1.5	8	—	—	1.20	M-1	
6	4	3	6	—	—	1.59	M-3	
6	4	2	5	—	—	1.345	M-2	
High-carbon chromium..							.955	D-3, D-5
Oil hardened manganese							.505	O-2
Special carbon							.38	W-1
Extra carbon							.38	W-1
Regular carbon							.325	W-1
Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.								

CLAD STEEL

Base prices, cents per lb f.o.b.

Cladding	Plate (L4, C4, A3, J2)			Sheet (J2)
	10 pct	15 pct	20 pct	20 pct
302				37.50
304	28.80	31.55	34.30	40.00
316	42.20	46.25	50.25	58.75
321	34.50	37.75	41.05	47.25
347	40.80	44.65	48.55	57.00
405	24.60	26.90	29.25	
410	22.70	24.85	27.00	
430	23.45	25.65	27.90	

CR Strip (S9) Copper, 10 pct, 2 sides, 38.75; 1 side, 33.10.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rail	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Unthreaded
Bessemer U1	5.75	6.725	7.25			15.35
Cleveland R3						10.10
Sa. Chicago R3						6.875
Ensley T2	5.75	6.725				6.875
Fairfield T2		6.725				10.10
Gary U1	5.75					6.875
Huntington C6		6.50				10.10
Ind. Harbor Y1						10.10
Johnstown B3		6.725				7.25
Joliet U1			7.25			18.10
Kansas City S2						15.35
Lackawanna B3	5.75	6.725	7.25			6.875
Lebanon B3			7.25			15.35
Minneapolis C6	5.75	7.225	7.25			10.10
Pittsburgh P5						18.10
Pittsburgh J3						6.75
Seattle B2						6.875
Steelton B3	5.75		7.25			6.875
Struthers Y1						10.10
Torrance C7						6.75
Williamport S5		6.50				10.10
Youngtown R3						10.10

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	\$14.50
Foundry, beehive (f.o.b.)	\$18.00 to \$18.50
Foundry oven coke	
Buffalo, del'd	\$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Ia., Pa.	29.25

LAKE SUPERIOR ORES

11.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight changes for seller's account.	Gross Ton
Openhearth lump	\$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cat Length)*	Cold-Reduced (Coiled or Cut Length)	
		Semi-Processed	Fully Processed
Field		9.875	
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor		12.475	
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30		
Grain Oriented			
Trans. 58	16.80	19.70	
Trans. 52	17.85	23.20	
		20.70	

Producing points: Bosch Bottom (W5); Brackenridge (A3); Granite City (G7); Indiana Harbor (I3); Mansfield (E3); Newport, Ky. (A9); Niles, O. (N3); Vandergrift (U); Warren, O. (R3); Zanesville, Butler (A7).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	15	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Super duty, Mo., Pa., Md., Ky.	Carloads per 1000	Price
High duty (except Salina, Pa., add \$3.00)		\$185.00
Medium duty		140.00
Low duty (except Salina, Pa., add \$2.00)		125.00
Ground fire clay, net ton, bulk		103.00
		22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$158.00
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	168.00
Western Utah	183.00
California	165.00
Super Duty	
Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00-168.00

Silica cement, net ton, bulk, Latrobe	29.75
Silica cement, net ton, bulk, Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

Chrome Brick

Standard chemically bonded, Balt.	\$109.00
Standard chemically bonded, Curtin, Calif.	119.00
Burned, Balt.	103.00

Magnesite Brick

Standard, Baltimore	\$140.00
Chemically bonded, Baltimore	119.00

Grain Magnesite

Standard, Baltimore	\$140.00
Domestic, f.o.b. Baltimore in bulk	\$73.00
Domestic, f.o.b. Chewelah, Wash., Luning, Nev.	46.00
in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Standard, Baltimore	\$140.00
Domestic, f.o.b. Baltimore in bulk	\$73.00
Domestic, f.o.b. Chewelah, Wash., Luning, Nev.	46.00
in bulk	46.00
in sacks	52.00-54.00

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Cented Nails						Woven Wire Fence	1 1/2" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'd	Merch. Wire Galv.
	Col	Gal	Col	Col	Col	Col						
Alabama City R3	173	187		212	193	9.00	9.55					
Aiquippa J3***	173	190		190	190	9.00	9.675					
Atlanta A8**	175	192		214	198	8.75	9.425					
Bartonsville K2**	175	192		176	214	9.10	9.775					
Buffalo W6						9.00	9.55*					
Chicago N4****	173	190		172	212	8.65	9.325					
Chicago R3						9.00	9.55					
Cleveland A6												
Cleveland A5												
Crawf. dar. M4**	175	192		214	198	8.10	9.775					
Donora, Pa. A5	173	187		212	193	9.00	9.55					
Duluth A5	173	187		212	193	9.00	9.55					
Fairfield, Ala. T2	173	187		212	193	9.00	9.55					
Galveston D4	9	101										
Houston S2	178	192		217	198	9.25	9.801					
Jacksonville M4	184	197		219	203	9.10	9.775					
Johnstown B3**	173	190		172	196	9.00	9.675					
Joliet, Ill. A5	173	187		212	193	9.00	9.55*					
Kokomo C9	175	189		214	195*	9.10	9.65*					
L. Angeles B2***	178	192		217	198*	9.25	9.801					
Kansas City S2*	178	192		217	198*	9.25	9.801					
Minneapolis C6	178	192		177	217	9.25	9.801					
Monessen P6						9.25	9.801					
Palmer, Mass. W6						9.30	9.85*					
Pittsburg, Cal. C7	192	210		213	210	9.60	10.15					
Rankin, Pa. A5	173	187		181	190	9.00	9.55					
Sa. Chicago R3	173	187		181	190	9.00	9.55					
S. San Fran. C6						9.25	9.801					
Sparrows Pt. B3**	175			214	198	9.10	9.775					
Struthers, O. Y1*						8.65	9.20					
Worcester A5	179					9.30	9.85					
Williamport S5												

* Zinc less than .10¢. *** .10¢ zinc.
** 11-12¢ zinc. † Plus zinc extra.
‡ Wholesalers only.

C-I SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT				
	0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. G6	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. T8	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. W12	10.70	12.90	16.10	19.30	
Boston T8	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. R7	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. S9	8.95	10.40	12.60	15.60	18.55
Cleveland A5	8.95	10.40	12.60	15.60	18.55
Dearborn S1	9.05	10.50	12.70		
Detroit D1	9.05	10.50	12.70	15.70	
Detroit D2	9.05	10.50	12.70		
Dover, O. G4	8.95	10.40	12.60	15.60	18.55
Evansville, Ill. M8	9.05	10.40	12.60		
Franklin Park, Ill. T8	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. C11			13.90	16.10	19.30
Indianapolis R5	9.10	10.55			

METAL POWDERS

Per pound, in ton lots for minus 100 mesh

Sponge iron, 98+% Fe, 100 mesh, freight allowed east of Miss. River, ocean bags, 23,000 lbs. and over	10.5¢
Sponge iron, 98+% Fe, 100 mesh, f.o.b. point of origin for shipment west of Miss. River, 100 lb. bags	9.5¢
100 mesh, cutting and scarfing grade, 100 lb. palls	8.5¢
40 mesh, welding rod coating, 100 lb. bags	7.7¢
Canadian sponge iron, del'd in East, 23,000 lbs. and over	10.5¢
Atomized iron powder, 98% + Fe, 40 mesh, f.o.b. point of origin, in 100 lb. bags	7.7¢
Atomized iron powder, 98% + Fe, f.o.b. point of origin, in 100 lb. bags—RZ-365—freight allowed east of Miss. River	10.5¢
Atomized iron powder, 98% + Fe, cutting and scarfing grade, f.o.b. point of origin	8.5¢
Electrolytic iron, annealed, 100 mesh iron powder, f.o.b. point of origin	10.5¢
Imported 99.5+% Fe	24.5¢
200 mesh	33.0¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Hydrogen reduced, 100 mesh iron powder, f.o.b. point of origin, 23,000 lbs and over	11.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe.	88.0¢ to \$2.85
Aluminum, freight allowed	38.00¢
Brass, 5000 lb. lots	31.0¢ to 46.7¢
Cobalt, reduced, 99.75% f.o.b. point of origin	42.9¢
Copper, electrolytic	41.00¢
Copper, electrolytic, imported, per lb., New York	41.9¢
Copper, precipitated, 24,000 lbs. and over, del'd	40.5¢ to 45¢
Copper, atomized	39.8¢ to 48.3¢
Chromium, electrolytic, 99.85% min. Fe .03 mix. del'd	\$5.00
Lead, f.o.b. point of origin (20,000 lbs. or more)	19¢
Manganese, f.o.b. point of origin	46.0¢
Molybdenum, 99%	\$3.60 to \$3.95
Nickel	\$1.05 to \$1.13

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill) Pct. Discounts

Bolts	Pct. Discounts			
	1-4 Containers	5 Containers	20,000 Lb.	40,000 Lb.
Machine				
½" and smaller x 3" and shorter	55	57	61	62
½" diam. x 3" and shorter	47	49½	54	55
¾" thru 1" diam x 6" and shorter	37	39½	45	46
¾" thru 1" diam. longer than 6" and 1½" and larger x all lengths	31	34	40	41
Roll thread, ½" and smaller x 3" and shorter	55	57	61	62
Carriage, lag, plow, tap, blank, step, elevator and fitting up bolts ½" and smaller x 6" and shorter	48	50½	55	56

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	62
¾ in. to 1½ in. inclusive	56
1½ in. and larger	51½

C. P. Hex, reg. & hvy.	Full case or Keg price
¾ in. or smaller	62
¾ in. to 1½ in. inclusive	56
1½ in. and larger	51½

Hot Galv. Hex Nuts (All Types)

¾ in. and smaller	41
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Semi-finished Hex Nuts

¾ in. or smaller	62
¾ in. to 1½ in. inclusive	56
1½ in. and larger	51½

(Add 25 pct for broken case or keg quantities)

Finished

¾ in. and smaller	65
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Rivets

¾ in. and larger	Base per 100 lb \$12.85
7/16 in. and smaller	Pct. Off List 15

Cap Screws

Discount (Packages) Full Finished H. C. Heat Treat

New std. hex head, pack-aged	Full Case
¾" diam. and smaller x 6" and shorter	54 42
¾", ¾", and 1" diam. x 6" and shorter	38 23
¾" diam. and smaller x longer than 6"
¾", ¾", and 1" diam. x longer than 6"
¾" through ¾" dia. x 6" and shorter	59 48
¾" through 1" dia. x 6" and shorter	45 32
Minimum quantity—¾" through ¾" diam., 15,000 pieces; 7/16" through ¾" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.	

Machine Screws & Stove Bolts

Plain Finish	Discount	Mach. Stove
Cartons	Screws	Bolts
Bulk	Quantity	Quantity
To ¼" diam. incl.	25,000-and over 60
5/16 to ½" diam. incl.		
15,000-200,000	60

Machine Screws & Stove Bolt Nuts

In Cartons	Discount	Hex Square
Quantity	16	19
In Bulk	25,000-and over 15	16
¾" diam. & smaller		

STEEL SERVICE CENTERS

Cities	Metropolitan Price, dollars per 100 lb.												
	Sheets	Strip	Plates	Shapes	Bars	Alloy Bars							
City Delivery Charge	Hot-Rolled (16 ga. & hvy.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled	Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed		
Atlanta	8.59	9.87	10.13	8.91	9.29	9.40	9.39	13.24*					
Baltimore	\$ 1.10	8.65	9.35	9.09	9.15	9.10	9.65	9.55	11.80*	16.28	15.28	19.82	19.08
Birmingham		8.18	9.45	10.46	8.51	8.89	9.00	8.99					
Boston	.15	9.48	10.54	11.55	9.84	10.17	10.13	10.26	13.49*	16.79	15.81	20.29	19.56
Buffalo	.15	8.40	9.75	11.45	8.90	9.35	9.40	9.30	11.60*	16.34	15.55	19.81	19.30
Chicago	.15	8.40	9.60	10.65	8.66	9.04	9.15	9.14	9.30	16.20	15.20	19.70	18.95
Cincinnati	.15	8.58	9.65	10.70	8.98	9.42	9.71	9.46	11.68*	16.52	15.52	20.02	19.27
Cleveland	.15	8.51	9.69	10.35	8.78	9.28	9.54	9.25	11.40*	16.31	15.31	19.81	19.06
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19				20.84
Detroit	.15	8.66	9.85	11.02	9.05	9.41	9.71	9.45	9.66	15.46	15.48	18.81	19.23
Houston		8.10	8.60		8.15	8.45	8.05	8.10	11.60	16.20	15.25	19.65	18.95
Kansas City	.15	9.02	10.27	11.37	9.33	9.71	9.82	9.81	10.22	16.87	15.87	20.37	19.62
Los Angeles		8.70*	11.20-11.80	12.15	9.15	9.10	9.25	9.10	12.95	17.30	16.35	21.30	20.60
Memphis	.15	8.55	9.80		8.60	8.93	9.01	8.97	12.11*				
Milwaukee	.15	8.54	9.73	10.79	8.80	9.18	9.37	9.28	9.54	16.34	15.34	19.84	19.09
New York	.10	8.97	10.23	10.66	9.74	9.87	9.84	10.09	13.31*	16.16	15.60	20.10	19.35
Norfolk	.20	8.20			8.90	8.65	9.20	8.90	10.70				
Philadelphia	.10	8.10	10.00	10.44	8.80	8.85	8.60	8.75	12.05*	16.58	15.58	20.08	19.33
Pittsburgh	.15	8.50-8.60	9.70-9.95	11.00	8.76	9.05	9.15	9.14	11.40*	16.20	15.20	19.70	18.95
Portland		10.00*	11.75*	13.30*	11.95*	11.50*	11.10*	9.85*	15.30*	18.50	17.45	20.75	20.25
San Francisco	.10	9.75	11.20	11.40	9.85	10.10	9.95	10.25	13.85	17.05	16.35	21.05	20.60
Seattle		9.95	11.15	12.20	10.00	9.70	9.90	10.10	14.70	17.15	16.80	20.65	20.60
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.85	17.75	16.95	21.55	20.75
St. Louis	.15	8.60	9.94	11.03	9.04	9.42	9.63	9.52	9.93	16.58	15.58	20.08	19.33
St. Paul	.15	8.94	10.19	10.86	8.99	9.45	9.53	9.70*	10.16		15.41		19.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **All sizes except 18 and 16 gage. †† 10¢ sine. ‡ Deduct for country delivery. * C1018—1 in. rounds. † 10 ga. x 36" x 120"; 20 ga. x 36" x 120"; 22 ga. x 36" x 96"; 24 ga. x 36" x 96"; 4¼" x 1" in lots of 1000 to 9999; † sheared plate ¼" x 84" in lots of 1000 to 9999; † 3" x 5.70" in lots of 1000 to 9999; † M-1020—1-in. rounds in lots of 1000 to 9999; † 16 ga. & heavier.

(Effective Oct. 27, 1958)

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Roller elliptical, 18 in. or longer, 5000 lb lots	41.50
Electrodeposited	32.75
Brass, 80-20, ball anodes, 2000 lb or more	45.50
Zinc, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	16.50
Nickel, 99 pct plus, rolled carton, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.55
Tin, ball anodes \$1.05 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	66.20
Copper sulphate, 100 lb bags, per cwt.	22.15
Nickel salts, single, 100 lb bags	45.00
Nickel chloride, freight allowed, 100 lb	82.25
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums (Philadelphia price 24.15)	23.70
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	45.50
Chromic acid, flake type, 10,000 lb or more	30.44

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.7
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Beas.	Low Phos.
Birdsboro, Pa. B6	68.00	68.50	69.00	68.50	
Birmingham R3	62.00	62.50*			
Birmingham W9	62.00	62.50*	66.50		
Birmingham U4	62.00	62.50*	66.50		
Buffalo R3	66.00	66.50	67.00	67.50	
Buffalo H1	66.00	66.50	67.00	67.50	
Buffalo W6	66.00	66.50	67.00	67.50	
Chester P2	66.50	67.00	67.50		
Chicago I4	66.00	66.50	66.50	67.00	
Cleveland A5	66.00	66.50	66.50	67.00	71.00†
Cleveland R3	66.00	66.50	66.50	67.00	
Duluth I4	66.00	66.50	66.50	67.00	71.00†
Eric I4	66.00	66.50	66.50	67.00	71.00†
Everett M6	67.50	68.00	68.50		
Fontana K1	75.00	75.50			
Geneva, Utah C7	66.00	66.50			
Granite City G2	67.90	68.40	68.90		
Hubbard Y1			66.50		
Ironton, Utah C7	66.00	66.50			
Midland C11	66.00				
Minnequa C6	68.00	68.50	69.00		
Monesen P6	66.00				
Neville Ia. P4	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda T1		66.50	67.00	67.50	
Sharpville S3	66.00		66.50	67.00	
Sa. Chicago R3	66.00	66.50	66.50	67.00	
Sa. Chicago W8	66.00	66.50	66.50	67.00	
Swedeland A2	68.00	68.50	69.00	69.50	
Toledo I4	66.00	66.50	66.50	67.00	
Troy, N. Y. R3	68.00	68.50	69.00	69.50	73.00
Youngstown Y1			66.50		

DIFFERENTIALS: Add 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, \$2 per ton for 0.50 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Add \$1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), H1, \$79.25; Jackson J1, I4 (Globe Div.), \$78.00; Niagara Falls (15.01-15.50), \$101.00; Koodak (14.01-14.50), \$103.50; (15.51-16.00), \$106.50. Add \$1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add \$1.25 for each 0.50 pct manganese over 1.00 pct. Baseless silvery pig iron (under .10 pct phos.); \$64.00. Add \$1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingot, roll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	30.25	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	28.25	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	33.75	33.75	34.25	34.25
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF, Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50	61.50	32.00	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J2; Baltimore, El; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Detroit, M2; Louisville, O., R5.

Strip: Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton, Massillon, O., R3; Harrison, N. J., D1; Youngstown, R3; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (plus further conversion extras); W1 (25¢ per lb. higher); New Bedford, Mass., R6; Gary, U1 (25¢ per lb. higher).

Bar: Baltimore, A7; S. Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R5; S. Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T5, R3; Ft. Wayne, I4; Detroit, R3; Gary, U1; Owensboro, Ky., G3; Bridgeport, Conn., N8.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D1; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2; Detroit, R5.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, U1.

Plates: Baltimore, El; Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C15; Vandergrift, Pa., U1; Gary, U1.

Forging billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R5; Munhall, Pa., S. Chicago, U1; Owensboro, Ky., G3; Bridgeport, Conn., N8.

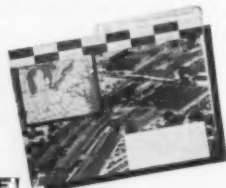
(Effective Oct. 27, 1958)

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about personnel problems

Dissatisfied with present recruiting methods?

The IRON AGE Employment Exchange is the meeting place for employers and men qualified in all phases of metalworking. For advertising rates, write to Chestnut and 56th Sts., Philadelphia 39.

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C.....	41.00	0.50% C.....	38.00
0.05% C.....	39.00	1.00% C.....	37.75
0.10% C.....	38.50	1.50% C.....	37.50
0.20% C.....	38.25	2.00% C.....	37.25
4.00-4.50% C, 60-70% Cr, 1-2% Si.....	28.75		
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si.....	28.25		
0.025% C (Simplex).....	36.75		
7-8½% max C, 50-55% Cr, 3-6% max Si.....	25.75		
7-8½% max C, 50-55% Cr, 3% max Si.....	26.50		

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe.

0.10% max C.....	\$1.31
9 to 11% C, 88-91% Cr, 0.75% Fe....	1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (¼" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads.....	\$1.15
Ton lots.....	1.17
Less ton lots.....	1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

Carloads, bulk.....	Cr 28.25	Si 14.60
Ton lots.....	33.50	16.05
Less ton lots.....	35.10	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed, 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads.....	25.65
Ton lots.....	27.95
Less ton lots.....	29.45

Calcium-Manganese-Silicon

Cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.....	24.25
Carloads.....	26.15
Ton lots.....	27.15
Less ton lots.....	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots.....	21.15
Less ton lots.....	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots.....	18.45
Ton lots.....	19.95
Less ton lots.....	21.20

Graphidex No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, SI 48 to 52%, TI 9 to 11%, Ca 5 to 7%.

Carload packed.....	19.20
Ton lots to carload packed.....	21.15
Less ton lots.....	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.....	12.25
Johnstown, Pa.....	12.25
Neville Island, Pa.....	12.25
Sheridan, Pa.....	12.25
Philo, Ohio.....	12.25
S. Duquesne.....	12.25
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.	
Briquets, delivered, 66 pct Mn:	
Carloads, bulk.....	14.80
Ton lots packed in bags.....	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.

16 to 19% 3% max.....	\$100.50
19 to 21% 3% max.....	102.50
21 to 23% 3% max.....	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.....	
Carload, packed.....	45.75
Ton lots.....	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads.....	34.00
Ton lots.....	36.00
250 to 1999 lb.....	38.00
Premium for Hydrogen - removed metal.....	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn.....

.....	25.50
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Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.

Carloads	Ton	Less	
0.07% max. C, 0.06% (Bulk) P, 90% Mn.....	37.15	39.95	41.15
0.07% max. C.....	35.10	37.90	39.10
0.10% max. C.....	34.35	37.15	38.35
0.15% max. C.....	33.60	36.40	37.60
0.20% max. C.....	32.10	34.90	36.10
0.50% max. C.....	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si.....	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk.....	12.80
Ton lots, packed.....	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet.....	15.10
Packed, pallets, 3000 lb up to carloads.....	16.30

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatche, Wash., \$106.50 gross ton, freight allowed to normal trade area, Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

Ton lots, packed	Carloads, packed	
98.25% Si, 0.50% Fe.....	24.95	23.65
98% Si, 1.0% Fe.....	24.45	23.15

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk.....	8.00
Ton lots, packed.....	10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si.....	14.60	75% Si.....	16.90
65% Si.....	15.75	85% Si.....	18.60
90% Si.....	20.00		

Ferrovandium

50-55% V delivered, per pound, contained V, in any quantity.

Openhearth.....	3.20
Crucible.....	3.30
High speed steel (Primos).....	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

Cast Turnings Distilled			
Ton lots.....	\$2.05	\$2.95	\$3.75
100 to 1999 lb.....	2.40	3.30	4.55

Alsiifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk.....	10.35¢
Ton lots.....	11.70¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo.....

.....	\$1.28
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Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots.....	\$4.00
Less ton lots.....	4.05

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta.....

.....	\$3.80
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Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.....

.....	\$1.68
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Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$5.00 unitage, per gross ton.....

10 tons to less carload.....	\$120.00
.....	\$131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti.....

.....	\$1.35
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Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti.....

.....	\$1.50
Less ton lots.....	\$1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton.....

.....	\$240.00
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Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered.....

.....	\$2.15
(nominal)	

Molybde oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa.,.....

.....	\$1.41
base, f.o.b. Washington, Pa., Langeloth, Pa.,.....	\$1.38

Siমান, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.....

Carload, bulk lump.....	18.50¢
Ton lots, packed lump.....	20.50¢
Less ton lots.....	21.00¢

Vanadium oxide, 86-89% V₂O₅ per pound contained V₂O₅.....

.....	\$1.38
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Zirconium, per lb of alloy 35-40% f.o.b. freight allowed, carloads, packed.....

.....	27.25¢
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12-15% del'd lump, bulk-carloads.....

.....	9.25¢
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Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B.....

2000 lb carload.....	\$5.50
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Hortram, f.o.b. Niagara Falls. Ton lots per pound.....

.....	45¢
Less ton lots, per pound.....	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.....

Ton lots per pound.....	14.00¢
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Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.....

.....	\$1.20
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F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up.....

10 to 14% B.....	.85
14 to 19%.....	1.20
19% min. B.....	1.50

Grinal, f.o.b. Cambridge, O., freight allowed, 100 lb and over.....

No. 1.....	\$1.05
No. 79.....	50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.....

Ton lots (packed).....	\$1.46
Less ton lots (packed).....	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots.....

.....	2.15
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(Effective Oct. 27, 1958)

RAILWAY EQUIPMENT

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RAILWAY CARS

All Types

**SERVICE-TESTED
FREIGHT CAR REPAIR
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For All Types of Cars

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STANDARD GAUGE CARS
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10-70 ton Capacity

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660 Cubic Feet
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Phone: YUkon 6-4766

"ANYTHING containing IRON or STEEL"

REBUILT — GUARANTEED ELECTRICAL EQUIPMENT

MOTOR GENERATOR SETS

Qu.	K.W.	Make	R.P.M.	Volts D.C.	Volts A.C.
1*	2000	G.E.	450	132/235	4180/2400
2*	2000	Whas.	750	600	13,800/6900
					4180
2	1250	Whas.	750	600	4160/2400
1	1200	G.E.	450	250	4160/2400
3	1000	Whas.	750	600	4160/2400
3	500	Whas.	1200	125/250	4000/2300
1	450	Whas.	900	290/300	2300
2	300	Whas.	1200	125/250	4000/2300
1*	300	Al.Ch.	1200	250/300	2300
2	200	Whas.	1200	125/250	2300
1	150	Whas.	1200	250	2300
1	150	G.E.	1200	250	4600/2300
2	150	Rel.	1200	125	2300

*—3 Unit Sets.

SPECIAL, before removal (1) 1875-K.W.
Whas., M.C. Set, Gen, 250-V.D.C., \$14
R.P.M. with 2700-H.P. Syn Motor, 13800/6900/
4000-V., 3 ph., 60 cy. with Control.

DIRECT CURRENT MOTORS

Qu.	H.P.	Make	Type	Volts	R.P.M.
1**	3000	G.E.	M.F.C.	300/600	250/360
3***	3000	Whas.	Rev.	325/600	600
1**	2200	Whas.	Mill	600	92/132
2**	1500	Whas.	Rev.	525	600
1**	1250	Al.Ch.	Mill	600	300/600
2**	940	B.S.	Mill	600	800/1000
1**	700	Whas.	Mill	600	143
4**	700	Whas.	Rev.	250	350/700
2**	645	B.S.	Mill	200	1000
1	600	Whas.	Mill	250	110/230
2	600	Al.Ch.	Mill	600	300/600
1	400	G.E.	M.F.C.	270	450
1	300	Whas.	Mill	230	200
2	275	Whas.	Q.M.600.6	250	425/850
1	175	G.E.	C.D.175-A	245	800/1025
1	125	Whas.	RE-184	230	575/850
1	125	Whas.	RE-190	230	450/1000
1	100	Rel.	461-T	250	1150/1500
1	100	Whas.	RE-183	230	430/1000
1	100	G.E.	CD-175	230	400/1200
1	80	Rel.	651-T	230	575/1150
1	80	EL.Dy.	25-R	230	525/1050
1	50/60	Whas.	RE-181	230	500/1300
1*	50	G.E.	CD-175	230	400/1200
2*	30/40	Whas.	RE-181	230	450/1500

*—T.E.F.C.

**—Enclosed Forced Ventilated.

***—Two Motors in Tandem.

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THE CLEARING HOUSE

Sales Tempo Quickens On West Coast

Used machinery sales are on the upswing in most West Coast markets.

Southern California buyers are looking for large lathes, vertical borers, and sheet metal equipment.

Upbeat news comes from West Coast used machinery dealers. All major sections — southern California, the San Francisco Bay area, Seattle—report increased sales and vigorous demand.

Aircraft and missile makers in southern California are after large lathes, 30 in. and up, and vertical boring mills, 14 ft to 20 ft. There are few of the large lathes in the area. The trade says the available ones are either too high in cost or too old. So dealers have their eyes open for purchases in the East.

Northern Upturn—Increasing accent on the use of stainless steel and heavier gages of carbon steels is giving an added boost to sheet metal equipment sales. Shears, rolls and press brakes are now red-hot items.

Northern California dealers report a sharp pickup started toward the end of last month. And it has been gaining momentum since. If the trend continues—and no one sees any reason why it shouldn't—business should be quite brisk by the first quarter of 1959.

Therefore, the pessimists who complained of a poor year are now hopeful the 1958 total will almost equal 1957. One optimist even feels the windup might be as good as last year.

Some Prime Movers — The fast pace of inquiries continues. Only now, more are converted into orders.

"Anything good in late models sells. But you have to guarantee everything," one executive observed.

Best movers: Grinders, turret lathes, tracer lathes, milling machines, power and hand shears, and brakes.

Prices Stronger—Prices are firm. Where prospects quibbled over price tags a few months back—and dealers anxious to move equipment frequently yielded—this no longer is the case. Improved demand plus the small price increases on new machinery have strengthened the used equipment market.

Best customers for used items are small machine shops, big repair outfits, and good customers who have a limited use for a piece of machinery and thus don't want to invest too heavily.

In fact, one dealer pointed out, such a piece of good equipment can be used for three or four years and then turned in on a new machine for only a 10 pct loss.

Seattle Confidence — There is a surge of confidence among Seattle area dealers. The previously gloomy outlook is changing. The big morale booster? A multi-billion-dollar Minuteman contract to the Boeing Airplane Co.

Although it's a little early to judge the full impact, used machinery dealers report inquiries for replacement parts on the upswing. Electronic devices and smaller machine tools appear to have the edge.

CONSIDER GOOD USED EQUIPMENT FIRST

ANGLE BENDING ROLL
4" x 4" x 3/4" Thomas #3 Horizontal

BALERS
Model 115P Logemann Hydraulic, Box 100" x 48" x 24"
24" Bale Size 24" x 14" x 16"
Model 123PX76 Logemann Hydraulic Baler Box 76" x 18" x 30" Deep, Bale 18" x 8"

BENDING ROLLS
12" x 3/4" Hillis & Jones Pyramid Type
13" x 3/16" Bertsch Initial Type—NEW
22" x 3/4" Baldwin Pyramid Type

BRAKE—LEAF TYPE
12" x 3/4" Drels & Krump #226

CRANES—OVERHEAD ELECTRIC TRAVELING
7 1/2 ton PAH 60' Span 230 Volt D.C.
8 ton PAH 55' Span 220/3.60
10 ton PAH 50' Span 230 Volt D.C.
10 ton PAH 39' Span 230 Volt D.C.
10 ton Milwaukee 57' Span 220 Volt D.C.
10 ton Shaw 48' Span 230 Volt D.C.
10 ton Whiting 75' Span 220/3.60 A.C.
10 ton Shaw 120' Span 230 Volt D.C.
15 ton PAH 30' Span 230 Volt D.C.
15 ton Northern 54' Span 230 Volt D.C.
15 ton Shepard Niles 56' Span 230 Volt D.C.
15 ton N-B-P 100' Span 220/3.60 A.C.
120 ton Shepard Niles 77' Span 220/3.60

DRAW BENCHES
3000 lb. Draw Bench, 26 ft. Pull
7000 lb. Draw bench, 50 ft. Pull—New 1956
10,000 lb. Draw Bench, 50 ft. Draw—LATE

FORGING MACHINES
17" to 57" Arce, Ajax, National

HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING
800 lb. to 12,000 lb. Incl.

LEVELERS—ROLLER
54" McKay 17 Rolls 4 1/2" dia.
60" Arce Standard, 17 Rolls 4 1/2" dia.
72" McKay, 15 Rolls 4 1/2" dia.
81" Hillis 17 Rolls 5 1/2" dia.

PRESSES—HYDRAULIC
500 ton Watson Stillman Piercing Press 48" x 72"
500 ton HPM Fastraverse, Bed 36" x 30"
600 ton Hrisburn, Platen 18 x 18", 15" Stroke
1000 ton HPM Fastraverse, Bed 48" x 72", 36" Stroke
4500 ton B-L-H Bed 68 x 68", Stroke 40"

PRESSES—STRAIGHT SIDE
190 ton Toledo #57 1/2, 10" Stroke, Bed 20" x 20"
215 ton Clearing, 24" Stroke, Bed 36" x 42"

PRESS—TOGGLE DRAWING
#168 3/4 Toledo, 18" Stroke of Blankholder, 28" Stroke of Plunger, Bed 48" x 51"

PUNCH & SHEAR COMBINATIONS
Buffalo #1 1/2 Ironworker
Cleveland Style C, Arch Jaw, Capy. 3/4" x 3/4"
Cleveland Style EP, Capy. 1 1/4" x 1"

ROLLING MILLS
6" x 5" Torrington Flat Wire Mill Line
2 1/2" x 9" x 9" 4-High Strip Mill
3 1/2" x 7" Six Roll Cluster Mill
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Single Stand Two High
20" x 36" Single Stand Two High

ROLLS—FORMING
6 Stand Dahlstrom #450-6 for stock to 4 1/2" wide up to 11 Ga.
18 Stand Custom Built, 2 1/2" Shaft, will take 36" wide

ROLLS—PLATE STRAIGHTENERS
108" Bertsch, Seven Rolls 9" Dia. Motor Driven
73" Niles 7 Rolls 9" Dia. Motor Driven

SHEAR—ANGLE
6 x 6 x 3/4" Hillis & Jones

SHEAR LINES
36" x 20 Ga. Haldien Shear Line
96" Cleveland, Capy. 14 Ga. Pay Off & Tables

SHEARS—SQUARING
6" x 14 Ga. Edwards, Motor Drive—LATE
10" x 3/4" Niagara
14" x 3/16" Cincinnati #1814

SLITTERS
12" Waterbury Farrel, 2 1/2" Dia. Arbor
30" Yoder M-2-1/2 Slitting Line
36" Yoder, 4 1/2" Dia. Arbor

STRAIGHTENERS
Torrington #1734 12-Roll, Capy. 1 1/4" Rd. 1-9/16"
12" Yoder Pull Thru Type Slitter
16" & 24" Waterbury Farrel Slitting Lines
1/2" Shuster, With 12 ft. Cut Off
3/8" Shuster, With 12 ft. Cut Off

SWAGING MACHINES
#4A Standard 2-Die, Capy. 2 1/4" Tube
#6 1/2 A Fenn Capacity 3 1/2" Tube 1 1/2" Solid
10" Die Length Hydraulic Feed, LATE

TESTING MACHINES
20,000 lb. Baldwin Univ. Hydraulic
50,000 lb. Baldwin Southwark Compression
60,000 lb. Olsen Univ. Hydraulic

TUBE REDUCERS
1 1/2" Tube Reducer for steel
2 1/2" Tube Reducer for aluminum

WIRE DRAWING MACHINE
Type B Morgan 4-Block Capy. #5 Rod down

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- MOTOR GENERATOR SETS**
- LARGE CONTROLS**
- DIRECT CURRENT EQUIPMENT.**

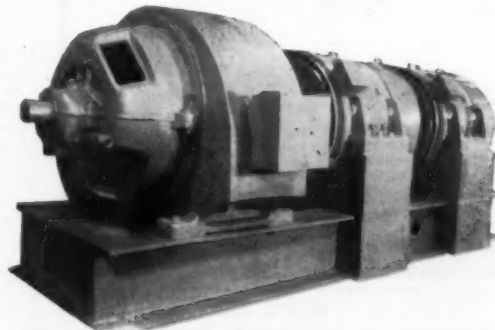


Photo at left shows special drive engineered and supplied one of the larger steel rolling mills in the East. This unit was designed and assembled in just six weeks time at a saving of over 50%.

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1200 KW	West.	400 V DC
1000 KW	West.	400 V DC
750 KW	Cr. Wh.	250 V DC
500 KW	G A R	250 V DC
400 KW	West.	300 V DC
305 KW	Cr. Wh.	250 V DC

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96 units—SPECIAL PRICE \$75.00 each.

Synchronous Mill Motors

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1200 HP	West.	120 RPM
800 HP	West.	257 RPM
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700 HP	West.	300 RPM
700 HP	West.	100 RPM
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- 1—15" & 30" x 31" 4-HIGH COLD MILL.
- 1—28" x 40" HOT STRIP MILL, 2-high, reversing, with 2500 HP D.C. motor generator, etc.
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- 1—28" PINION STAND, 2-high, modern design.
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- 1—3000 HP GEAR DRIVE, ratio 16.2 to 1.
- 1—1200 HP GEAR DRIVE, ratio 592 to 1.
- 1—1200 HP GEAR DRIVE, 355 to 94.6 RPM, 3.73 to 1 ratio.
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1—1000# hr., 5 dia.—500 KVA, 4160/3/60
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 tion, m.d.
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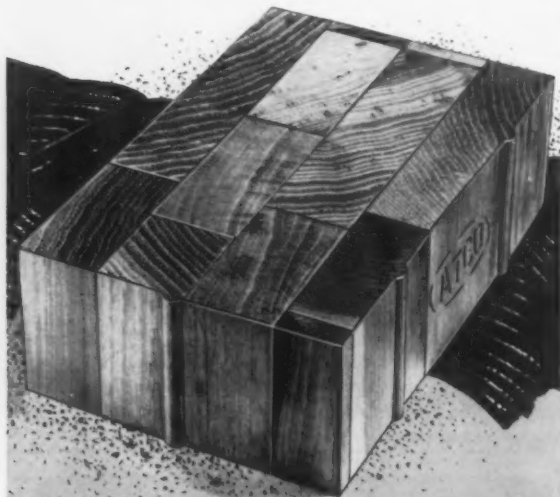
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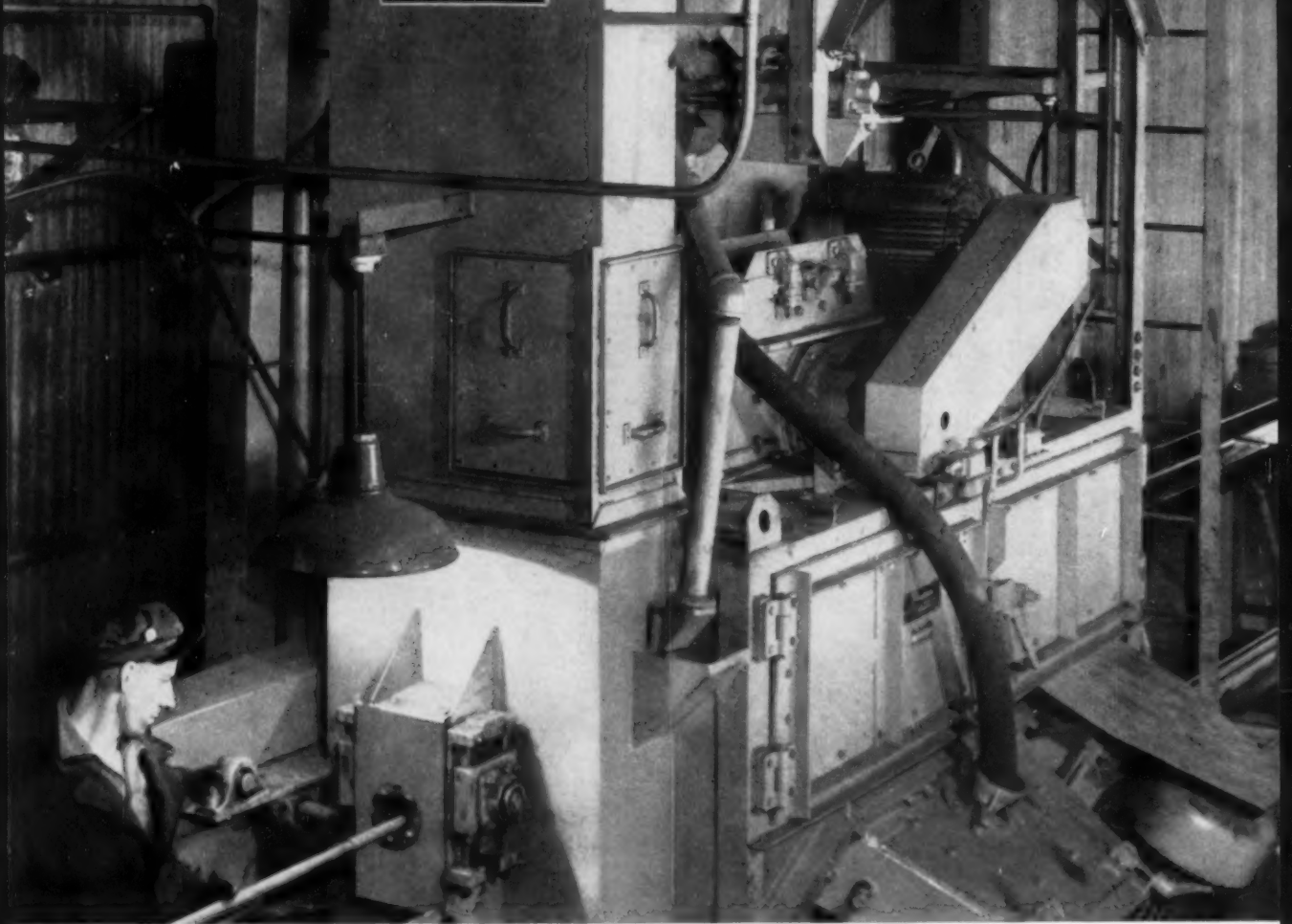
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U. S. Army photo

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Make sure you get all these

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